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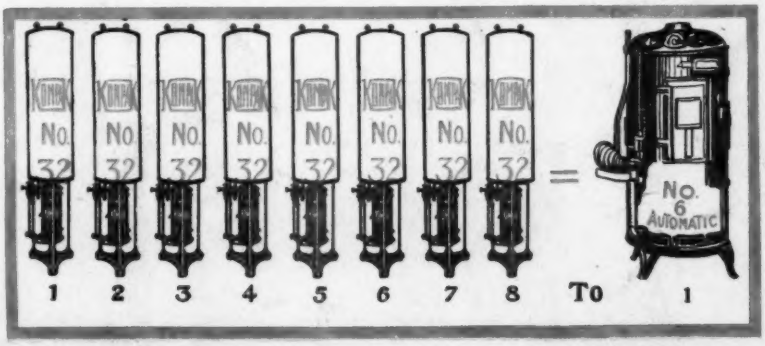

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THE KOPPERS COMPANY

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ON THE OPERATION OF BY-PRODUCT COKE
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THE KOPPERS COMPANY
PITTSBURGH, PA.

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American
Gas Engineering Journal

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A Bright Future for the Gas Company Worker Assured—the Destiny of the Gas Company Lies in Its Own Hands

Gas Inevitably Must Be the Nation's Most Important Fuel—Whether the City Gas Company Supplies This Gas or Not It Will Have to Be Manufactured and Utilized, and the Man Who Knows the Trade Will of Necessity Be Much in Demand

By E. D. CARPENTER

Conditions of the past few years have given us a glimpse of possibilities for the gas industry that come close to being astounding.

It can, and possibly will, do away with urban garbage collection as we now know it.

This in itself is a tremendous possibility. High-grade and high-priced brains have been given to this essentially engineering task for years. Millions of dollars have been and are being spent upon it. Innumerable means of disposal have been tried out.

The gas that will go to eliminate the horses and wagons, the motor trucks, the armies of human beings laboring at garbage disposal, the scows, the piggeries, etc., will in the aggregate mount to a tremendous volume.

Will Heat All Urban Homes

Gas undoubtedly will heat the homes and business places of cities from those of moderate size up. This again will require an output in itself transcending any we have hitherto known. And added to it will be the corresponding summer load that must be found to keep the works at capacity when no house heating is needed.

Few industries will use solid fuel, perhaps even so early as a generation from now. What quantities of gas must be produced to provide for this need!

These are big possibilities well within sight.

Then, there is the need for auxiliary producers of motor fuel. The motorized vehicle, the airplane, the farm tractor, the stationary engines are increasing in numbers even faster than the sources of gasoline are diminishing.

Worker Sure to Profit; Company—Perhaps

If one stops to reflect on how big, how important, the gas industry might be he grows dizzy. But will the gas industry as we know it reap even a tenth of the possibilities it might?

One strongly doubts it as he realizes the handicap of the restrictions that bind it down from which it must free itself, the seeming lack of interest manifest toward paving the way toward the gaining of this business.

It would seem that this is a matter on which the gas company owner and the gas company worker do not have a common worry. Whether the present city gas company supplies the city's space heating or not, whether or not it supplies the industries with fuel, whether it produces motor fuel or not has little or no concern for the gas company worker. His personal opportunities will be no less boundless, for if the city gas company does not supply these things some other company will, and the man who is trained in gas manufacture and production will be afforded a hundred opportunities where now he has one.

But the gas company owner has something to worry about. He may be the whole thing as a supplier of gas in his territory, or he may be a small adjunct supplying some few small parts of the business, and those the unprofitable parts.

For the gas man the future is assured, however the cat may jump. A young man alinging himself with the gas industry to-day is putting himself in the way of learning a calling in which future possibilities are of the brightest.

For the Company Future Problematical

It is for the gas company that the future is problematical. And even in its case there is much that is encouraging. Its destiny is largely in its own hands to be just as bright as it merits that it be.

The day when the major part of the fuel used in the industries will be gas is distant. Likewise the day when cities' house heating will be by gas. But that day is not so far distant that the gas company should not be now preparing itself so that this business will come to it as a matter of course.

Price a Big Factor

Of one thing we may be certain: the gas companies

will never supply more than a slight fraction of the fuel required by the industries, nor more than a slight fraction of that needed to incinerate a city's garbage or heat a city's homes at the kind of rates now being charged for domestic gas.

The price of gas must be brought down radically if the gas industry is to reap richly of the opportunities that loom immediately ahead.

The price may be brought down perhaps by, as a side line, supplying that needed increment of motor fuel that will be needed, for which even now there is a demand. It may be brought down, perhaps, by strict engineering devisement or rearrangement. It may be brought down even by almost completely eliminating that absurdity of sending a meter reader around each month to take the record of a consumer that buys ten or twelve dollars' worth of gas a year.

If the writer knew how it could be brought down and still leave a possibility of existence to the gas company, he wouldn't be telling it in this article. He would be selling it quietly to some big gas company and be preparing to retire to a life of ease and opulence on the proceeds therefrom.

A Problem for Many Minds

It will not be one man's mind, but the minds of many men doubtless, which will find the means to attain this end. Anyone with the least enlightenment in the gas business can suggest a dozen lines of attack to deal with the problem, any one of which may be *the* line of attack that may lead to achievement, or perhaps none of which will. Municipally hired experts almost every month of the year are telling gas companies how they may make and sell gas more economically. But, fortunately for themselves, these experts do not have to manage the gas companies or foot the bills.

The point of this argument is not to tell gas companies how they may sell gas cheaper yet with profit, but that this is the thing they *must* accomplish if they are to be industrially great in the future.

This is their prime problem.

How are they to solve it?

Not by mental inertia, not by hopefully waiting for some miracle to happen, but by hard earnest thinking, by practical thinking—not, for example, when they are discussing house heating to discuss it from the point of their situation when they have all the business. They must get it by degrees and adjust themselves to it by degrees—and the quicker they get down to thinking, planning and executing the better it will be for the soundness of their securities.

Tartaric Oil from Coal Tar

New Chemical Process Also Yields Other Important Products

Tartaric acid from coal tar by a new method has been developed on a satisfactory scale, it was stated recently at a meeting of scientists by the inventors and patentees of the process. Not only can tartaric acid be obtained, but a number of other important substances necessary to economic development and aidful toward the lowering of the cost of living.

The details were explained in a joint paper read before the New York Section of the American Chemical Society and written by the inventors and patentees of the process, John M. Weiss and C. R. Downs, respectively the manager and the chief chemist of a firm of chemical manufacturers.

The basis of the process is a method of building up various substances from maleic acid obtained from benzol, one of the derivatives of dark and viscid coal tar. Maleic acid has been separated from the juices of certain plants and fruits, but at so high a cost that it could not be put on the market and was considered merely as a laboratory curiosity. By the Weiss-Downs process benzol is mixed with air and the vapor is passed over a catalyzer, a material which alters the speed of chemical reactions without being in itself affected. On account of their mysterious power to join other substances in chemical wedlock, catalyzers are known as "chemical parsons."

With maleic acid as a base it is possible to prepare other valuable acids.

Of these, the most welcome to the housekeeper and the trade is tartaric, which hitherto has been made from the cream of tartar, a solid found in the bottom of wine casks and employed principally in the making of baking powder. The United States, before the prohibition wave engulfed the vineyards where wine grapes are raised, produced 10,000,000 lb. of cream of tartar a year and about 1,000,000 lb. of tartaric acid. As the cream of tartar cannot be obtained except through the fermentation of the wine, the grape-juice industry is unable to supply the household want hitherto filled from the vats of the vintner. There was a large importation from Europe before the war, but it was checked by the military situation.

By the new process citric acid can also be derived from the maleic acid base. Citric acid causes the sour taste of lemons and other citrus fruits, and is used in lemonade and orange drink compounds. It is much employed also in the arts.

Lactic acid can also be manufactured inexpensively by the new method. It was originally derived by fermenting milk, as its name implies, although there are now several other processes for preparing it synthetically. Recently farmers have been giving lactic acid as a tonic and appetizer to pigs; for although the porcine breed is supposed always to be hungry, it is found that its craving for food and powers of assimilation, and therefore its weight, could be greatly increased by such a prescription. This acid is consumed in large quantities in the dyeing of wool and is of much worth in various industries.

Succinic acid, which is useful in making many laboratory tests, can also be derived at a low figure by the newly devised method. As it is obtained by the distillation of amber ordinarily, this substance is costly.

Maleic acid synthesized from benzol, the inventors state, can also be employed as the basis of new dyes, medicinals and perfumes. They believe, in fact, that it will open up an entirely new field of synthetic organic chemistry. Arrangements are being made to manufacture products from this new source on a large scale, as the process would render the United States independent of foreign supplies of several important raw materials. Three American patents have been issued to the authors.

Correction.—An article in the Jan. 31, 1920, issue of the American Gas Engineering Journal, under the title, "Sees the Horizontal Retort Going Into Disuse in British Gas Undertakings," should have been credited to the editorial columns of the Gas World (London).

The Need of Radical Readjustments in Gas Rates

George H. Priest Presents a Study of the Existing Theory in the Light of Present-Day Conditions

Has there ever been a more opportune time to consider the possibility of some radical changes in rate making?

To attempt the expounding of any original theories on methods of charging for gas would be to display profound ignorance of the splendid work already performed by such pioneers in the gas and electric industry as Hopkinson, Wright, Doherty, Gardiner, Frueauff, Forstall and many others, whose contributions relating to this subject seem to have covered almost every conceivable line of thought worth following.

It is an unfortunate fact that the sound theories advanced by these men have not been more universally adopted by the gas fraternity and the public. The present time seems particularly opportune to revive the question of scientific rates, for many companies are passing through a critical period of low earnings, with future prospects uncertain. The majority of us are probably looking for a ray of light which will point the way to more net revenue.

The object of this paper of George H. Priest's, general manager of the Brockton (Mass.) Gas Light Company, which he read before the meeting of the New England Association of Gas Engineers on Feb. 18, is not to advance new theories but to present a study of existing theory and practice in the light of present-day conditions, enlarging in particular upon the three following subjects:

1. The unprofitable customer, and the need of analyzing the service costs of all classes of customers.

2. The need of some form of fixed service charge to make the unprofitable customer pay his own costs and relieve the profitable customer from a part of his present unjust burden.

3. The possibility of encouraging increased consumption from the average customer by more scientific rate differentiation.

As long ago as 1906 the able committee on rates of the American Gas Institute characterized the "uniform rate by meter" as "primitive and pernicious," and expressed the hope that the rapid growth of differential rates would continue. The great majority of gas and electric engineers have probably accepted this idea in whole or in part, but the application of it has been comparatively slow, especially among gas companies, and the question now arises: may not the large increased application of this apparently sound doctrine furnish the means of relief to those gas companies that are struggling with poor success to make their revenue equal their expenses?

Our friends the electric companies have been much more progressive along these lines. Their boldness in making excessively low rates for wholesale power, in conjunction with a multitude of minimum charges, service charges, capacity charges, readiness-to-serve charges, etc., etc., have startled the conservative gas man, who has been, however, altogether too slow in following their example.

Compared with the average gas company, the average electric company is to-day in a state of unaccountable prosperity, after rate increases which have seemed absurdly small to gas men. How much of this prosperity can be explained by their large development of profitable business by the scientific application of modern rate theories?

The gas man, by nature conservative, with a comparatively long period of slow growth and ancient history behind him, has hesitated to depart from the customs of his ancestors, in charging for gas, on the grounds that changes are dangerous, unpopular, complicated, not readily explainable, and what not, leaving well enough alone, while his youthful electric competitor has confidently left the trodden path to discover for himself the short cut to maximum revenue from minimum investment.

The present theories of differential rates were conceived before the world war at a time when the trend of prices and costs of production seemed consistently downward. For this reason, perhaps, their universal application appeared much less imperative than would have been the case had present-day conditions obtained. While *average profits* were large, it seemed unnecessary to many managers to analyze their various classes of business to find out where the profit came from. Some of them never have known how many unprofitable customers were on their books, or how much more business they might have obtained if rates had been more nearly proportioned to the various costs of service, or how much lost business they might have saved—this last the saddest feature of all, because it has the greatest effect on net earnings.

To-day we are faced by the startling facts that profits of any description have vanished for some of us; that profitable business has been lost for good; that an alarming percentage of our customers cost us more money than they pay for service, and that further increases in uniform gas rates in many cases promise only to drive away more business.

Has there ever been a more opportune time to consider the possibility of some radical changes in rate making?

We have seen the trolley lines go from bad to worse, from apparent prosperity to junk, in a few short years; very largely as a result of a uniform rate which was entirely inadequate to pay the costs of service to a large class of patrons who now find their property stranded in the open country, with no public means of transportation. The loss of money to railway stockholders is probably of secondary consideration in comparison with the calamity which has befallen many innocent families who have been encouraged to build in the country by a fallacious schedule of rates for trolley service, persisted in for such a long time that it now seems impossible to re-educate the riding public to a point where they are willing to pay a sufficiently high rate to support the business.

The smaller gas companies in particular have suffered most from the present-day conditions, not only because constantly rising costs of production have increased their costs per thousand feet to a greater extent than with the larger companies, but also because the necessarily high rates resulting have still further raised the unit cost by cutting down sales.

The unprofitable customers of a gas company are

like the country trolley lines, except that the latter have this advantage: they can be separated from the profitable portion of the transportation system and abandoned, and there seems to be no law to compel their owners to continue to serve the patrons of an unprofitable branch.

The nature of gas distribution makes it a physical impossibility to separate the profitable from the unprofitable, and the gas companies must continue to serve both so long as both demand service on the same street main.

This physical impossibility of abandoning unprofitable business seems to invest the public utility with the moral right, if not the legal authority, to differentiate its charges among various classes of customers in such a way as to make every class of business profitable, so far as possible. Where local statutes prevent the application of a reasonable system of rates designed to carry out this theory, the recourse would seem to be a concerted movement of the interested companies which should result in new legislation to meet present-day conditions.

The Desirable System of Rates

Generally speaking, the most desirable system of rates for any community is the one which will furnish to all of the public the maximum value of service at the minimum rates consistent with a fair return on the capital invested.

Applying this principle to the present situation, what conditions are not satisfactorily complied with?

Obviously, in many of the smaller companies at least, the maximum value of service is not being rendered, because excessively high rates, where charged, have discouraged the use of gas to such a point that the average consumption per meter is far below normal. The gas consumer, like the trolley rider, is not willing to pay the advanced prices, and curtails his use accordingly. Here lies the possibility of benefiting the public, if more service for the money can be supplied.

Obviously, again, present rates are not providing a fair return on capital invested, for many gas companies need immediate relief in the shape of more revenue.

Those companies which have advanced their rates seemingly to the top notch are apparently no better off in net profits than their contemporaries who were supposedly less fortunate in securing generous increases.

Meanwhile, as the public and the stockholders argue their cases before the various courts of justice, competitors in the fuel and lighting business are taking advantage of many fertile fields of dissatisfied gas consumers.

The cry on one hand is "lower rates" and on the other, "more revenue for dividends." Can both be satisfied?

It is self-evident that lower rates, in the face of rising production costs, are, as a rule, impossible, unless some element can be injected into the situation which will carry with it the possibility of cost reduction along with rate reduction.

For the same reason more service, costing more money, cannot readily be supplied at existing rates.

On the other hand, more revenue can hardly be expected from customers who already think that rates are too high. There will be a normal growth, of course, depending on general business prosperity. It is also true that for the past few months the majority of companies in the vicinity of Boston have shown encouraging signs of renewed life, due in part, no doubt, to the wave of extravagance which now seems sweeping the country, and in part to the congestion of population within the radius served by existing gas mains.

Both of these causes may have a reaction, and we must not too easily forget that only twelve months ago gas outputs were declining and production costs were soaring, and still continue to soar.

Additional Revenue from Present Consumers Cannot Be Counted On

The additional revenue from present customers at present rates cannot be counted on even to offset the everlasting increases in payroll.

To obtain a substantial increase in gross earnings, then, some method must be discovered to induce the gas-consuming public to avail themselves of gas service to a larger extent than ever before, and to pay for this service at rates which will provide a larger return on invested capital.

Real Answer Larger Earnings from Lower Rates

The problem, at first glance, appears to contain two paradoxical hypotheses: how to obtain more business—at higher rates. The real answer may be, not more business at higher rates but larger earnings from lower rates, providing those rates are so devised as to make every class of business show a reasonable profit.

There are two ways of reducing the cost of gas per thousand cubic feet. The first and most obvious way is to reduce the actual expenses of making and selling the present output; the second, and most satisfactory, is to increase the sales of gas on existing mains and with present organization.

The first method is already overworked to a point where good service is in danger of being curtailed—and still expenses rise.

The second method, then, holds more promise of fulfillment, and possesses the large advantage of being a positive and progressive movement instead of a negative and reactionary one.

The immediate question is: what inducement can be offered to attract more gas consumption from our present customers? Aggressive new business tactics, of course; but these must be accompanied by the promise of lower rates for increased consumption, if the desirable amount of new business is to be obtained. Lower rates, in many cases, however, cannot be granted without early bankruptcy on the part of those companies whose gross earnings will not suffer even a temporary reduction without disaster. Provision must be made to offset the loss before it begins, and the most logical opportunity seems to lie in:

1. The Unprofitable Customer

This individual has been assumed by some State commissions and lawmakers to be a downtrodden laboring man, who must be favored by paternal laws which will enable him to take his place in society, on a level with his fellow man, whether he can provide his own modern conveniences or not. If not, then his more fortunate neighbor should pay a portion of his gas and electric bills.

Not to question the charitable spirit of this assumption in pre-war days, the times have changed so that the average wage-earner of to-day is able to support himself in rather more luxury than ever before. More-

over, the smallest gas consumer, as often as not, is not the person least able to pay his own gas bill.

The dentist with a tiny bunsen burner for occasional use, the landlord or theater manager with an emergency gas light to cover the law, the merchant who wants gas light only when his electricity fails, the lady of means who buys coal for the servants to use but wants gas for a day or two when the cook quits in a hurry—these, and a thousand others with similar demands, swell the number of unprofitable customers and offer no particular argument for discrimination in their favor.

If the number of unprofitable customers was small their existence might be tolerated on the grounds that nobody would know they were there, but it is an unfortunate fact that the sum total of such business is surprisingly large and the loss occasioned by carrying so many trifling accounts is a serious burden, both on the company and on the average customer. This loss can well be applied to a reduction in rates to those customers whose gas consumption and revenue comprise the bulk of the company's business.

To show the importance of this unprofitable class a recent analysis of the business of one of the larger Massachusetts companies, which may not be far from typical of the conditions in the majority of places, will be used for an example.

These results are certainly startling enough to cause very serious reflection:

Eighty-five per cent of the total number of customers were using only 55 per cent of the total output, and were paying at the rate of less than 6 per cent return on invested capital.

The other 15 per cent were using 45 per cent of the output and paying rates which yielded 6 per cent return on investment plus enough more to make good the losses incurred from the 85 per cent.

Fifty-five per cent of the customers were using only 25 per cent of the output and were not paying the company sufficient money to cover the bare costs of production, distribution and general operating expenses incurred on their behalf, to say nothing of a return on the investment they were using.

General Managers Should Make Careful Analysis of Existing Conditions

These figures are of such importance that no engineer or manager should accept them, or any others, for his own company. The situation warrants a careful analysis of existing conditions for every company by the man responsible for its management. This is not a tremendous task, and a few days' study on the part of any manager who has never taken the trouble to do it before will probably open his eyes to inside conditions he may never have dreamed existed.

The method of analysis is briefly described at the end of this paper.

This 85 per cent of the number of customers using 55 per cent of the gas sold, at an average loss to the company, furnishes the material with which to build an entirely new rate schedule which will so encourage additional business that the very class of customers whose rates must be raised may eventually profit by the change.

A rate schedule designed to make the present unprofitable customer pay back the greater part of his own costs will cause him to do one of three things: it will influence him to dispense with the service, if the latter has no particular value to him, in which case he will have suffered no serious loss and the company will be greatly benefited; or, he will continue to use gas, if it has value to him, at a rate which, while still trifling to him, will recompense the company for service rendered; or he will be encouraged to use a larger amount of gas to obtain a lower rate, thereby enlarging the value of gas service to him, because it can then be furnished at a more favorable rate than would be possible under the present heavy burden of unprofitable business.

State commissions have been somewhat averse to taking any steps which suggested any discrimination against the very small consumer, or the average consumer, in favor of the wholesale consumer.

If the example quoted is typical, the *average* customer is being discriminated against and the maximum value of gas service to the community is being rendered impossible. If the truth of this charge can be established, all parties concerned, from the public to the public utility commissions and lawmakers, should give immediate consideration to:

2. The Need of Some Form of Fixed Service Charge

This need was long ago recognized by the deeper students of gas rates and many suggestions have been advanced for various forms of readiness-to-serve rate schedules, the majority of which appear to possess great merit over the old uniform rate by meter. One cannot fail to be impressed by the logic of the three-part rate devised by Henry L. Doherty, which consists of a fixed customer charge, a demand charge based on hourly demand, and a uniform charge per thousand for gas consumed. The application of this rate, however, requires the use of a limiting demand governor, which may appeal to conservative New Englanders as too progressive for this climate at the present moment.

Unfortunately, none of the many rate theories have been tried in actual practice for a long enough time or on a large enough scale to derive conclusive results based on experience. Service charges, however, are rapidly coming into use among gas, electric and water companies, and these public utilities in at least thirty-eight States in the Union have already adopted some form of charge which will provide for the fixed cost of serving every customer.

The Denver Gas & Electric Company has had in effect for a number of years a wholesale three-part gas rate which apparently has proven its worth. On Jan. 31, 1918, the Denver wholesale schedule was as follows:

Fixed customer charge, $6 per year.

Demand charge, $12 per year per 100 cu. ft. maximum hourly demand.

Output charge, 65 cents per 1,000 cu. ft. of gas.

Entire bill subject to a discount of 5 cents per 1,000 cu. ft. gas consumption.

Time is too short to review many of the recent rate decisions and opinion of the various State commissions relating to this matter.

New Hampshire Has Taken Advanced Position in Science of Rate Fixing

A study of the situation as it exists to-day in a large number of the most progressive States leads to the conclusion that the Public Service Commission of the State of New Hampshire deserves the credit for having taken one of the most advanced positions in the science

of rate fixing yet observed, and its methods are well worth a careful investigation. This commission has recognized the logic in the three-part rate calculation and has approved rates which embody some of the main features of this system. They have also been very frank in making public statements to show why the unprofitable customer cannot be tolerated.

In brief, the system of rates now in use in New Hampshire consists of a fixed service charge to all customers, graduated according to the size of meter required, from 25 cents per month for a two, three or five light meter to $1.70 per month for a 250-light. In conjunction with the service charge many of the companies have adopted a block schedule of rates in which the first block is usually 10,000 cu. ft. and the second and third blocks 20,000 cu. ft. each.

This system recognizes the fixed customer cost to the extent of the minimum meter charge, the varying demand cost by the graduated scale of meter charges, and the output cost by the block schedule of rates. It does not go so far as to proportion the actual demand cost to the individual customer to a sufficient extent to permit of a uniform consumption charge for all gas consumed.

The principal criticism of this system would be that the service charges are not more than half large enough to meet the various costs they are intended to cover. A movement has been started to have the minimum meter charge increased to 50 cents per month, which seems to be the smallest amount that will repay the fixed cost of service. A number of managers of New Hampshire companies have expressed themselves as heartily in favor of the present system, with the exception of the insufficient amount of the service charge, and the intelligent and fair-minded attitude of the State commission gives promise that this defect will be remedied at an early date.

Noteworthy Expression of New Hampshire Commission on Gas Rates

The expression of the New Hampshire commission regarding gas rates, service charge and theory of public utility rates is very interesting. They say:

"The best and fairest way to secure due responsibility on the part of every consumer is by the use of a service charge, which shall be one sufficient to make sure that no individual consumer is served at an actual loss in out-of-pocket expense to the company. When it is settled, as it is beyond all possibility of doubt, that each consumer causes a certain expense to the company regardless of the amount of gas which he uses, or though he uses no gas at all, it is perfectly clear that there can be no justice in a system of rates which allows him to escape the payment of that expense and shift the burden to some other class of consumers. If it costs 25 cents a month to be ready to serve each consumer, then each consumer should pay 25 cents a month, regardless of his consumption of gas. And he should then pay his share of the cost of making and distributing the gas by paying for the gas that he actually uses."

This statement, and much other valuable information, appears in Volume VI, Advance Sheet No. 7, published by the Public Service Commission of New Hampshire. The case of Charles Kinch et al. vs. Concord Light & Power Company is well worth reading, for the commission goes to some length to explain why it has supported the graded service charge.

The Public Service Commission of the Commonwealth of Pennsylvania has recognized the same principles in a substantial way, as shown by their approval of the following schedule for the Penn. Central Light & Power Company:

Size of Meter Installed	Ready-to-Serve Charge Dollars per Month
3 light	$0.70
5 "	0.75
10 "	0.85
20 "	0.90
45 "	1.25
60 "	1.50
60A "	2.10

Pennsylvania Companies Have Adopted Similar Schedule

Many other Pennsylvania companies have adopted a similar schedule.

The Pennsylvania commission has expressed itself as follows:

"The ready-to-serve charge should vary in recognition of the variation in demand as evidenced by the size of the meter. * * *

"There is no distinction in principle between a system of minimum payments and a system of ready-to-serve charges. Both are predicated upon the same analysis of the total cost of service. Both recognize the element of 'Stand ready to serve. In a schedule with minimum payment requirements, the ready-to-serve costs are concealed in the rate per unit and in the minimum. In a schedule with a pure ready-to-serve charge these costs stand revealed. * * *

"A ready-to-serve schedule can be made to follow more closely the cost of the service, and hence results in a more equitable division."

The State commissions of New York, New Jersey, Wisconsin and a number of other progressive States have also recognized these principles, but New Hampshire is the only State known to have applied the graded service charge to every gas company in the State.

Unfortunately for Massachusetts gas companies, Section 186 of Chapter 742 of the Revised Laws of 1914 expressly states that no charge for the use of a meter during any portion of the twelve consecutive months preceding the thirtieth day of June of any year shall be made if the consumer during said time uses gas to the value of seven dollars.

This law has been construed for a long time to mean that $7 per year shall be the minimum charge to any customer. This law was framed many years ago, under entirely different conditions, and it is a great misfortune that such a relic of bygone days should now impede the progress of gas development in this State.

There are strong indications that this law will not long withstand a concerted attack, and every Massachusetts company should exert its influence in the right direction to secure a repeal and open the way to scientific rates. When the opportunity comes to institute a service charge, co-operation should be obtained among all the companies involved so that an unbroken argument can be presented to the proper authorities for a properly graded charge to cover the actual cost of service.

Careful Publicity Regarding Service Charge Is Essential

The fact that an average service charge of 50 cents per month will permit the average company to reduce its price from 20 to 30 cents per thousand is an argument well worth considering. When the service charge is presented to the public for consideration very careful publicity should be given the matter, as it is essential that all consumers should be made to understand as thoroughly as possible the absolute reasonableness of the charge, thereby avoiding the immediate loss of meters which seems to have followed the adoption of this practice in certain instances where the consumers failed to understand the situation. The majority of companies report no losses of consequence. It is very necessary that the public should know that they are not paying something for nothing, but a fair price for value received.

3. The Possibility of Encouraging Increased Consumption by More Scientific Rate Differentiation

A study of the unprofitable customer naturally leads to the thought, can the average customer be made more profitable? Additional business is a very attractive idea to the manager's commercial instincts, and it is easily demonstrated that new business from old customers is of more value than the same business from new customers. One of the big talking points for the appliance salesman is the chance of reduced rates for increased consumption.

It is a well-known fact that the average consumption per meter increases in adverse ratio to the gas rate. A flat reduction of gas rates is, of course, impossible under present conditions, but certain rather convincing facts indicate the possibility of a considerable improvement in present conditions by the application of rate reductions at the psychological point where the largest inducement can be offered for increased consumption. It must be shown, of course, that such a reduction will be a mutual benefit to company and consumer.

The average consumption per meter for Massachusetts gas companies is approximately 2,000 cu. ft. per month. Small customers predominate, and the number of large industrial users is comparatively small, although their consumption may be large. The usual custom in this State is to charge one rate up to perhaps 10,000 cu. ft. per month, in some cases to 50,000. One price up to 10,000 cu. ft. means a *uniform rate* to all customers who use less than five times the average, although the cost curve separates rapidly from the rate curve above the average consumption point, showing that the rate charged is by no means in proportion to the cost of service for the customer burning from 2,000 to 10,000 cu. ft. per month.

What would be the effect of offering the 2,000 cu. ft. customer an inducement to burn 3,000 or 4,000 cu. ft.? If he accepted it, certainly a very large increase in sales, at no cost to the company except the rate reduction and the additional gas. The question is, then: What reduction can be offered which will be large enough to attract the business and small enough so that the resulting rate will be more profitable to the company, with the increased business, than the original rate without the increase?

New Rate Schedule to Induce More Business Is Matter of Self-Preservation

Extreme cases usually give the most striking example. The following figures are furnished by one of the smaller Massachusetts companies, which has been obliged by war conditions to raise its price 90 cents per thousand. The excessive rate has reduced the consumption per meter to 1,000 cu. ft. per month, or just one-half of the average for Massachusetts.

The total cost of gas, including fixed charges, is $3.33 per 1,000 cu. ft. and the average revenue is $2.43, leaving a deficit of 90 cents. The present rate, high as it is, will not earn the interest charges on floating debt. It is plain that a further increase in rates would make matters worse. It is certainly a condition and not a theory that confronts this company. As a matter of self-preservation, some new rate schedule must be applied immediately in an endeavor to induce more business. The uniform rate has been thoroughly tried out and proved an absolute failure under these conditions. One thousand cubic feet a month will never earn many dividends for any company, no matter how high the rate.

The desirable thing, of course, is to make that 1,000 cu. ft. grow to 2,000 by means of an increase in every customer's use. It is evident that a big inducement must be offered for the second thousand. As it is too much to hope that the average consumption can be doubled at once, no matter what the rate, an estimate has been made to determine the lowest rate that could be made if the consumption could be increased 50 per cent from present customers. The total increased cost was found to consist only of gas produced, so that 50 per cent additional business would raise the operating expenses only 15 per cent. The cost per thousand would thereby be reduced 75 cents. On the strength of this saving it was decided to reduce the rate at once 50 cents per thousand for all gas in excess of 1,000 cu. ft. per month, with an additional reduction of 25 cents above 10,000.

A service charge is, of course, desirable for this company, but the present law makes a service charge impossible. An attempt has been made, however, to obtain the same result by the use of a new schedule under 1,000 cu. ft., as follows:

Minimum Charge	Fifty Cents
100 cu. ft. gas	$0.85
200 " " "	1.05
300 " " "	1.25
400 " " "	1.45
500 " " "	1.65
600 " " "	1.85
700 " " "	2.05
800 " " "	2.20
900 " " "	2.35
1,000 " " "	2.50

Objectives of This Schedule

There are three main objectives in this schedule: First, to make the small customer pay his fixed cost; second, to encourage consumption above 1,000 cu. ft., the present average; and, third, to lower the rate to all large customers in order to encourage more wholesale business. If the desired increase of 50 per cent can be obtained, the net revenue of the company will be in-

creased 22 cents per thousand, the average gas rate reduced 9 cents, and the rate for all gas in excess of 1,000 cu. ft. per month reduced 50 to 75 cents for the benefit of the average customer whose needs are shown to be around 2,000 cu. ft. per month by the figures of other companies. This apparently creates a mutual advantage to all concerned, except the very small customer, who is largely responsible for the present crisis.

Reducing the rate does not guarantee the increased output, but it is the strongest inducement that can be offered and, in fact, the only one yet suggested under the conditions in question. The actual results can only be determined after a working trial.

This extreme case has been quoted to demonstrate a principle. If a scientific rate differentiation, designed to meet the needs of this particular company, will produce the desired results, the same principle applied to different conditions may have value. Those fortunate companies selling 2,500 to 3,000 cu. ft. per customer per month will probably not be interested. Many of us, however, have not reached this desirable state, and there is bare possibility that even some of these favored ones might improve their conditions.

Going back to the larger company first quoted, a study of the cost and rate curves shows the usual conditions of a prolonged uniform rate and rapidly falling costs as the consumption increases up to about 75,000 cu. ft. per year.

The customer cost varies from $5.24 per 1,000 cu. ft. for the group of smallest customers to 4 cents per 1,000 cu. ft. for the largest customer. The total cost varies from $6.04 to 84 cents per thousand, with an output cost of 80 cents, showing that with the largest customers the customer cost is almost a negligible quantity, while with the smallest customers the output cost is by far the smallest consideration.

The average customer, using about 20,000 cu. ft., is costing the company 27 cents more than the 50,000 cu. ft. customer. Both are paying the same rate. It seems logical that at some point between 20,000 and 50,000 a rate reduction might be applied which would encourage all customers above 20,000 cu. ft. to use more gas to the advantage of all concerned. The stumbling block to this reduction is the unprofitable customer, whose loss must be eliminated before the man a little better than the average can be given the rate he deserves.

Rate Schedule Designed to Make Rate Curve Parallel to Cost Curve

It would seem, as a general principle, that the maximum amount of business, at the lowest cost to the company, could be obtained by designing a rate schedule which would result in a rate curve as nearly parallel to the cost curve as conditions would permit. The chance exists with a large number of companies to make a revision of rates which will equalize the burden of costs among all classes of customers, and this improvement can be carried a long way before the small customer can honestly claim he is being discriminated against.

It can be readily demonstrated that much additional business can be acquired with a surprisingly small increase in operating expense. This is the cream that pays the profits, and deserves the most careful study in order to determine the logical system of rates which will make its attainment possible. The amount of new business that can be taken on at a low cost will vary with local conditions. In general, additional sendout can be added up to the safe working capacity of the manufacturing plant and street mains, at a cost very slightly above the production cost. The plant may, however, approach a point where a very large investment may be required to make efficient enlargements, and unless the time is opportune for such an expenditure it may be advisable to retard rather than accelerate new business activities.

Given a plant with a large reserve capacity, the proposition of accepting a large industrial load at the bare cost of production may result in a general reduction of fixed expenses per thousand which will reduce the unit cost of all gas sold. In assuming such a load, however, care should be taken not to commit the company to a rate which must be continued after the conditions which made it profitable have ceased to exist.

It has not been the purpose of this paper to discuss the various factors which enter into a study of industrial service, such as load factor, maximum demand, diversity factor, etc. These items have great importance in particular cases and should be considered as special studies. If attention has been focussed on the need of making the unprofitable customer a source of profit, and using the advantage gained to stimulate additional business by more carefully devised rate schedules, the object of the paper has been attained. Conditions will not be satisfactory in this State, however, until co-operation of an active nature among the interested companies results in new legislation and the adoption of much needed reforms.

Following the description of the method of cost analysis is appended a list of refernces, many of which will be found of great value in a study of this subject. The list does not pretend to be complete, however, and apologies are offered for omissions. Thanks is hereby extended to all who have assisted the writer.

Method of Cost Analysis

The various classes of consumption must be divided, from the consumers' ledger, into a sufficient number of groups to furnish points from which to plot a curve. For example, the first group may contain all customers using less than 1,000 cu. ft. per year; second, those using from 1,000 to 5,000; third, 5,000 to 10,000; fourth, 10,000 to 20,000; and so on to suit local conditions or rate schedules. From the results of this analysis a curve can be plotted using the cumulative per cents of total number of customers as one ordinate and the cumulative per cents of total yearly consumptions as the other. This curve will show at a glance the volume of business provided by any given percentage of customers, beginning with the smallest.

The next step is to separate the various items of annual operating expense into two classes: those which vary only with the number of customers, and those which vary with the output of gas. This division is, of course, an arbitrary one; but common sense and a little thought will result in a close approximation to actual facts.

The fixed charges on capital invested must be determined, and for convenience divided into interest and depreciation charges and taxes; interest including all amounts necessary to furnish a fair return on the fixed and working capital used in the business, under the local conditions prevailing; depreciation to include the annual amounts above current operating charges made for repairs and renewals necessary to maintain the en-

(*Continued on page* 147.)

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As the Journal Views It

George H. Priest on Radical Changes in Rate Making

Mr. Priest's contribution to the meeting of the New England Association of Gas Engineers held in Boston this week, which is printed elsewhere in this issue, is a worthy one and demands the careful consideration of every man responsible for the management of his company.

Mr. Priest sums up in a few words the existing conditions of to-day and very aptly asks: "Has there ever been a more opportune time to consider the possibility of some *radical* changes in rate making?"

He takes the stand that the AMERICAN GAS ENGINEERING JOURNAL has taken for many years, that the solution lies in not more business at higher rates, *but larger earnings from lower rates.*

He has analyzed the problem in straightforward, clear-cut fashion, and he has gotten down to the root of it. He gives two excellent samples of where loss is now incurred, viz., the unprofitable customer, and the unpaid for readiness to serve. Further, he suggests logical methods to offset these losses. He has also outlined a method of cost analysis which he says, if followed, will more than likely open the eyes of the man responsible for the management of his company to inside conditions he may never have dreamed existed.

Summing up his paper, Mr. Priest believes that for self-preservation the gas industry needs to encourage consumption, and as a means to that end adopt some new rate schedule that will induce more business. This, we believe, appeals to all those who have given thought and consideration to our prob-

lem as the only logical solution. What is needed now is action.

Keeping the True Perspective

There is a great deal of routine about the gas business, much of the cut and dried. There is a real temptation to get one's nose into a groove and keep it there; in fact, the wonder is that men in greater numbers have not done so.

But there has always been an interesting vista ahead for the gas industry. Always it has afforded the man of vision an inexhaustible field for dreams, for at no time could any man hope that he could live to see the gas industry catch up with and enfold the boundless possibilities that he could rationally foresee as legitimately its own.

Right now we are in the midst of possibly the industry's most interesting period and one highly critical to its future.

With the certainty ahead that the majority of dwelling places and working places will be heated by gas, that the major part of all industries will look upon the combustion of solid fuel as obsolete, upon what the gas industry as we now know decides will determine whether this boundless fuel market will be supplied by the city gas plant or by other agencies.

The rate for city gas—as it is general to-day—is a flat rate and a species of bribery. To cater to public favor the vast multitude is served at a loss and the big user is held up to make up the deficit.

Naturally, even though it may be profitable for him to use gas even at such rates, the big gas user resents and rebels against paying an unjust premium for the service. If there should be an alternative to the exactions of the city gas plant he will avail himself of it. He may join with his fellows and erect a private plant or he may make a dicker with a company that is not a public utility with its burden of unprofitable consumers to provide for at a price that is somewhat proportioned to the cost of the service.

The gas industry, viewed from the perspective of its broad possibilities, is going from bad to worse in the matter of rates. Each increment of cost added narrows the uses for which people will buy and consume gas. That these increased rates are a grim necessity, that upon them depend the very existence of the gas companies, explains the underlying reason of a seemingly unreasoning departure, but does not make these increased rates any the less regrettable. There is no broad visioned gas man, ambitious that his industry attain its full possible importance, who does not view with sorrow each new increase he sees applied for.

Increased rates to an ambitious gas industry do not represent an end. They represent merely a distressing temporary expedient to tide over until the best means to the end is found.

Upon the solution of the problem of providing cheaper gas despite high basic costs depends the future status of the gas industry. If the problem is not solved it cannot hope to be any greater than it now is.

And the country will grow. The gas industry will become puny and insignificant in comparison.

It will be an industry threatened and harassed constantly by politicians and the fear of municipal ownership.

But, of course, the problem will be solved. Various possible solutions have already been offered. Perhaps not one of them is *the* solution, but men's minds are directed intently upon the problem and the solution will be found.

It is not the first time the gas industry had to meet a problem upon which its very existence depended.

To meet the problem in the best manner, countless stubbornly cherished notions will have to be sacrificed, many practices, policies and attitudes will have to be changed.

To develop and expand as the gas industry must will require teamwork of the highest order, an overabundance of employee independence and expression, co-operation and good-will. All shackles of precedent must be thrown aside to secure it.

To-day there is not the trust and the confidence in the companies that should exist in the grades of their organizations. This defect should be remedied and there is only one cure—straight and square dealing so manifest that none can distrust or even suspect it.

A Unique Opportunity for the Gas Heater

Provident persons have learned to put in their entire winter's supply of coal the summer before.

A good many of them had a suspicion that this was going to be a severe winter.

Accordingly they ordered generously.

Nevertheless, over almost impassable roads, the coal trucks are again beginning to move in large numbers.

Though generously discounted the demands of the winter have exceeded expectations.

But the season is nearing its allotted period. Amongst those whose coal piles have become disquietingly slim there is a great reluctance to place an order for a helping out ton or so.

Their heating season will not come to an end for weeks yet; perhaps months. It will not be continuous heat they will want, but heat now and then. And they are eager for some expedient that will enable them to hobble through.

More than the factor of expense is involved. It is

a matter of pride. John Jones, who figured ten tons would be enough—then ordered twelve to be sure—is highly reluctant to admit even to himself that he was wrong in his judgment.

A unique opportunity is presented gas companies to belatedly dispose of a large number of gas heaters.

Point out to John Jones how they will spare him the need of ordering more coal; how they will almost pay for themselves in that they will only be an expense when heat is actually needed—they will not have to be kept burning on slow draft so they may be more readily brought up to temperature to meet sudden emergencies.

Heaters now sold will serve the gas company well. For some weeks to come they will be in frequent use.

On summer nights they will be frequently lighted, constituting a very desirable load that otherwise would not be had.

Next fall and next winter, too, they will be brought into frequent service.

At present costs of gas supply the gas man has to be more or less of an opportunist to build up big in house heating. Just now a chance exists that the opportunist will leap at eagerly.

From the Journal Sixty Years Ago

Gas company stocks were paying from 6 to 12 per cent dividends in the following cities: Adrian, Mich.; Albion, N. Y.; Batavia, N. Y.; Bridgeport, Conn.; Brooklyn, N. Y.; Chicago, Ill.; Cohoes, N. Y.; Evansville, Ind.; Ithaca, N. Y.; Leavenworth, Kan.; Middletown, Conn.; New London, Conn.; Portsmouth, Ohio; Staten Island, N. Y.; Tarrytown, N. Y.; Utica, N. Y.; West Troy, N. Y., and Yonkers, N. Y.

Gas coal could be had at Morgantown, Va., at 75 cents per ton. It wants a gas works, suggesting facetiously that since the county has "but seventy-five darkies" the town will be easy to light.

To whom could this interperate language have been directed? It was written sixty years ago, published as an advertisement in the New York Commercial Advertiser and reprinted in the JOURNAL: "We earnestly hope that universal public opinion and the voice of the press will now compel efficient legislative action to protect us from the vile and atrocious swindling of our city gas companies; their gas has, this winter, attained its maximum degree of impurity, as its light-giving properties and vile smell amply prove to the most stupid observer." Yes, the writer had an axe to grind. He wanted to introduce "Sanders' Illuminating Water-Gas."

Jos. Battin inquires: "How we shall get clear of the deposit that is found in main gas pipes, of a substance technically known as Napthaline, and what will prevent its formation and deposit?"

The Need of Radical Readjustments in Gas Rates

(*Continued from page* 144.)

tire plant in condition to perform the work it was designed for.

The sum of operating expense items and fixed charges will then represent the total amount of annual revenue which must be earned to pay a fair return after all charges.

In order to determine the actual expenses and fixed charges occasioned by any group of customers it is necessary to make a still further analysis of a somewhat arbitrary nature. Opinions will naturally differ on this last separation of costs, but it is a peculiar and convincing fact that widely differing methods of analysis always reach the same general conclusion; namely, that there are surprising differences in the costs of supplying service to various classes of business, and that these differences have almost never been adequately provided for in rate schedules.

CONSIDER ONLY THREE CLASSES OF EXPENSE

One of the simplest and most accurate methods of allocating the various costs of service to the proper groups is to consider only three classes of expense: First, the expense which is practically fixed for every customer whose account is open; second, the expense which varies in more or less direct proportion to the demand for gas by the customer; and, third, the expense representing the actual production cost of the gas, "expense" in all cases including operating items and fixed charges on property involved.

The first class of expense will consist in almost all cases of fixed charges on the service and meter of the individual customer and his share of the distribution and general expenses which are incurred on his account, whether any gas passes through his meter or not. The average figure for this class of service expense in various parts of the country seems to be from $6 to $12 per customer per year, with no cases on record under $6 and very few over $9.

The second class of expense offers the largest opportunity for diverging opinions. The rate of demand may be calculated from a momentary, hourly, daily, monthly or yearly standpoint. In the case of consumers requiring larger than a twenty-light meter the demand can best be figured on an hourly basis, or in certain large industrial installations on a momentary basis. These are special cases, however, and the general run of business can be figured on a monthly or yearly basis. Certain items of expense cannot readily be assigned to any one class. Regarding those accounts whose classification is obscure, some distribution can usually be effected which will not vitiate the total to any great extent. It is simpler, although not strictly accurate, to assess all fixed charges on manufacturing plant to production cost, and fixed charges on distribution plant to demand or fixed customer cost.

The third class of expense, production cost, will then consist of actual holder cost or its equivalent, if gas is purchased, plus fixed charges on manufacturing plant. This cost should be calculated per 1,000 cu. ft. of gas *sold*, unless the cost of unaccounted-for gas has been taken care of in distribution expenses. In the case of special industrial business which has been or can be acquired only by an extremely low competitive rate, the

fixed charges on the manufacturing plant may be forgotten, provided no new investment is involved and the customer and demand charges are properly taken care of.

Having assigned to each group of customers all of the expense items in accordance with the three classes described, it is a simple matter to get by addition the total expense occasioned by each group and compare it with the total revenue, the difference being the profit or loss over and above the predetermined rate on capital invested.

The total costs per 1,000 cu. ft. of gas should be calculated for each group and the results plotted in the form of a cost curve. The rate curve per 1,000 cu. ft. can be plotted on the same sheet to show at a glance the relation between the cost of service and income for any customer.

Several striking features will stand out in the comparison of cost and rate curves for almost any gas company. The cost curve will drop in a nearly perpendicular line from the minimum consumer to the average consumer, while the rate curve is usually horizontal until it crosses the cost curve at about the point of average consumption, leaving a very wide space between the two, which represents the failure of the unprofitable customer to pay his own costs. Beyond the average consumption point both curves tend to flatten to horizontal lines representing production cost in the case of the cost curve, the usual wide margin between the two indicating the large profits derived from large customers to make good the losses of the small ones.

In the case of the small company previously quoted, an analysis of customers by classes shows that 88 per cent of the customers are using 52 per cent of the output at an average rate of 560 cu. ft. per month. The average cost per thousand of serving this 88 per cent runs from an average of $5.47 for the first group, using 250 cu. ft. per month, to $3.28 for the group using 1,000 cu. ft. per month.

The fixed cost of serving each customer is $8.75 per year, if no interest or other fixed charges on manufacturing plant and street mains are assessed against him.

The demand cost for all customers averages $14.80 per year, and ranges from $3.92 for the smallest group, and $15.62 for the group using 1,000 cu. ft. per month, up to $1,148 for the largest industrial consumer.

After the customer and demand charges are provided for, the actual consumption cost of gas is $1.25 per thousand. If all the customers would pay an average fixed charge of $1.92 per month the gas rate could be cut in half. The total cost of gas, including 6 per cent interest charges, is $3.33 per 1,000 cu. ft. sold and the average net revenue is $2.43.

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Process for Coking Coal

According to a German patent, 298,861 (1916), by E. Fleischer, Dresden, coal, without external heating, is submitted to the action of steam and hot fire gases or a mixture of the products of steam, air and gas at a temperature of 800 to 900 deg. Cent. The volume of steam in the mixture should be greater than the volume of the steam free gas. If the coke produced at 800 deg. Cent. is heated to 1,000 deg. Cent. by steam free gas or combustion products having a temperature of 1,100 deg. Cent. and then cooled by treatment with steam at about 100 deg. Cent., the yield of ammonia is increased in proportion to the volume of steam incorporated with the gas mixture at 800 to 900 deg. Cent. without reducing the temperature.

A French Tar Producers' Association

The current number of the Journal des Usines a Gaz publishes a notice of the central Committee of Tar Producers and Distillers in France formed in November last. On it are represented all the chief producers and gas companies. The president is M. Laurin, of the Paris Gas Company. The objects of the association are the study and production of the economical, industrial and commercial interests of the tar industry, and especially the consideration of the best means to adopt for increasing and regulating sales. The headquarters are at the office of the Paris Gas Company, No. 6 Rue Condorcet, Paris IX.

Repairing an Unusual Break in a Gas Pipe Crossing the Neponset River

Herbert Neal Cheney, engineer of construction of the Boston (Mass.) Consolidated Gas Company, told before the meeting of the New England Association of Gas Engineers on Feb. 18 of the way they handled an unusual repair job. What Mr. Cheney said follows:

"A somewhat unusual problem arose last spring in connection with a gas pipe crossing the Neponset River at the new Neponset Bridge. A syphon had been built and lowered into place in the mud of the river bottom. The syphon is approximately 175 ft. long, with risers about 40 ft. high at each end. It contains a 12-in. gas main and a 12-in. water main. A heavy timber box had been built, the two pipes laid in it, and the space around the pipes filled with concrete. Then the whole mass had been lowered into place. The gas pipe had a drip tee at each end, since it could not be foretold with certainty which end would be the lower. Fortunately, the end on the Neponset side of the river proved to be the lower.

"The work had been practically completed (except for connecting the gas and water pipes at the ends), when a workman carelessly dropped a 4-in. plug down the Boston riser. As the plug weighed about 17 lb. and fell about 40 ft., it is not surprising that the bottom of the drip tee was broken out so that the water filled the syphon. The break was so large that the water level inside the pipe practically followed the ebb and flow of the tide.

"The problem then was, first, to get the 4-in. plug from the bottom of a 12-in. pipe, 40 ft. high, and, second, to repair the break in a permanent manner. No divers could be used in this location, as it would have been next to impossible to get at the outside of the pipe through the mud, timber and concrete before mentioned. Any patch put on the inside had to withstand a water pressure from the outside of some 36 or 37 ft.

"The method of repair was largely worked out by D. S. Reynolds, designing engineer of the Boston Consolidated Gas Company, under whose personal supervision the repair was made.

"First, a small orange-peel bucket was obtained. This bucket is capable of operating inside a 12-in. pipe, and at the first attempt brought up the plug. Next, the break in the bottom of the tee was studied by means of a wooden form made nearly like the inside of the foot of the drip tee and covered with modeling clay. This form was pushed down to the bottom by successive lengths of small pipe. After two or three attempts a good impression of the break was obtained.

"A triangular piece, roughly 3 to 4 in. on a side, had been broken out of the bottom of the drip tee. As the bottom of the drip tee was very close to the timber casing of the syphon, what little concrete lay below the tee had also been broken, and possibly the timber had been injured.

"Experiments were now made with various cements to determine the best to use under the conditions, which required that the material should be capable of being placed under 35 ft. of salt water. As a result of these experiments it was decided to use litharge and glycerine.

"A cast-iron plug was made nearly filling the 12-in. pipe. It was intended to lower this plug on top of the cement after it had been placed. The plug was made as thick as it could be without encroaching on the gas passage; that is, the top of the plug was intended to be flush with the bottom of the level run of pipe in the syphon. The loss of the sump at this end of the syphon was not important, as the pipe pitched slightly toward the other end. The weight of this plug not being of itself sufficient to overcome the upward water pressure, a piece of 3-in. wrought-iron pipe, with several 1-in. holes bored in it near the lower end and along its length, was attached to the plug. This pipe was made in short sections to facilitate lowering the plug. The weight of the plug and the 3-in. pipe together was sufficient to overcome the upward water pressure.

"The work of making the repair was begun at high tide. This was so that until the litharge had hardened there would be no tendency for water to flow into the syphon. First, all the modeling clay which was left from the experiments was made into a ball and driven down into the break, using the wooden form before mentioned to do this. The clay made a good joint so long as the pressure was outward, and prevented flow of water from the gas pipe as the tide fell. Next, a quantity of litharge and glycerine was mixed and deposited in the bottom of the tee. To do this the small orange-peel bucket was used, it being filled with the mixture, lowered gently through the water, and then opened and raised. Finally the cast-iron plug was lowered by successive lengths of the 3-in. pipe mentioned, the last piece of 3-in. pipe having a spider to keep it centrally located in the 12-in. gas pipe. Next day the syphon was pumped out. It has not leaked since."

Separation of Liquid Mixtures

The liquid mixture, e. g., mononitrotoluenes, is allowed to flow from either of two storage vessels to a point rather below the middle of a distilled column which is heated by an internal steam coil and packed with metallic gauze or beads. The temperature, vacuum, etc., are maintained to such a degree that only the most volatile constituent is distilled and rectified on its passage up the column. The liquid residue passes out from the column at the bottom and is caught in two crystallizers, the temperature of which is maintained so that only the highest melting point constituent crystalizers are fitted with perforated trays to allow of the easy separation of crystals and liquid.

Electrical Precipitation of Tar Fog

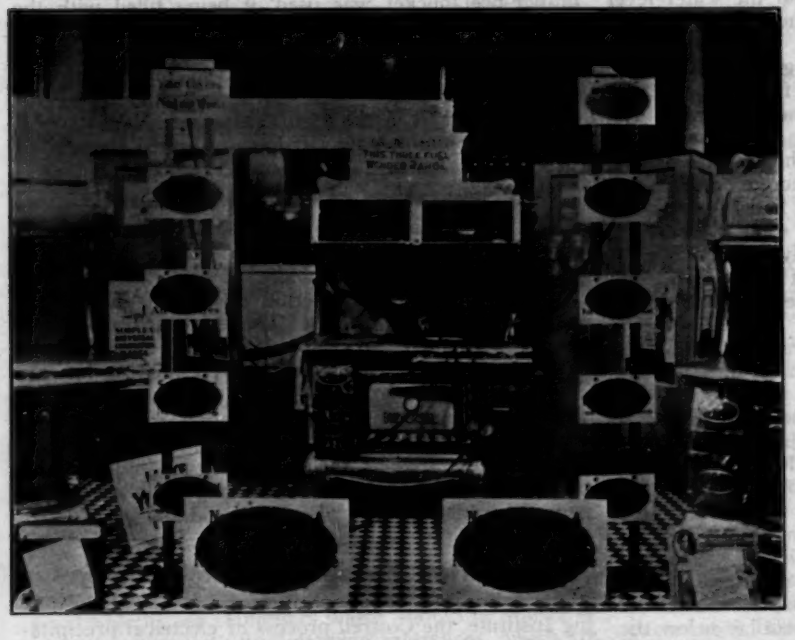
According to a communication to the Canadian Mining Institute, the Cottrell process of electrical precipitation of tar fog is quite able to deal with the crude gases produced in the distillation of coal, wood and petroleum even at high temperatures used in modern industrial processes, while the usual methods of tar removal in extractors require cooling of the gases. The author of the communication referred to stated that he obtained cleaner distillates with electrical precipitation than formerly. The chamber he used consisted of an iron pipe 75 ft. high by 12 ft. in diameter provided with fused quartz insulators. The heater requires 2 to 3 h.p.

Helpful Hints for Educating People to Use of Gas By Publicity, Suggestion and Comparison

Baltimore Company Emphasizes the Gift Shop Idea in Their Window Display

By WILLIAM BLISS STODDARD

All noted pedagogues tell us that the education of a people must be gradual. Of course, in the cities everybody acknowledges the superiority of gas, but in the smaller towns the people must be "shown," and there is nothing like publicity, suggestion and actual comparison to convince the average householder of the advantage of any labor-saving device.



BINGS, OF CLEVELAND, WINDOW-DISPLAYING COMBINATION RANGES

Company Paper Helps Sale of Gas Supplies

In a town surrounded by a large farming community, where such a thing as "neighbors" really exists, no better means of publicity for gas appliances can be obtained than a crisp monthly paper. Such a one is gotten out by the Peoples Gas Light & Coke Company, of Chicago, and is enclosed with the monthly bill. It is called *The Peoples Gas Gazette*. Another such paper is *The Wilson News*, issued by the Wilson Company, Waterloo, Neb. "Very little formal advertising is used in our company paper," said the genial manager, "for to do that would defeat its purpose and put it in the class of handbills. What we aim to do is to make a regular newspaper out of it—one that will be looked for in advance and read from beginning to end. There is always an editorial; generally some article of information taken from one of the leading trade papers, such as "Saving Gas with the Fireless Cooker"; a poem or a little story by one of the local authors, while the greater part of the paper is made up with locals. All sorts of interesting information about our fellow citizens is picked up in conversation with patrons during the month, and these are jotted down and afterward reprinted in the *News*. Then, too, whenever we sell a gas stove, or irons, or hot-water heater, or any kind of gas appliance, the fact is announced in the little paper. In a small community this is not advertising but real news, and the housewives read with interest that Mrs. Jane Smith has bought a gas iron, or that Tom Brown has purchased a gas engine. They make it a point to call on these people and see the new possessions, and the more they talk about them the better it is for our business. Then, we frequently take a trip out into the country to see how Tom Brown likes his gas engine, or the Whites their gas range, or Mrs. Smith her iron. They are generally pleased to talk about them, and some very good interviews are obtained. Once in a while a camera is taken along and we secure a photo of Brown and his engine, or the White tribe and their range. These pictures are reproduced in the paper—and whenever they are run there is an unusual demand for the paper—and it is sent far and wide. Of course, we seldom hear from people in other States; but when the paper is sent to towns or farms within a hundred miles of

here we can frequently trace sales to these kodak pictures run in the *News*.

Emphasizing the Gift-Shop Idea in Window Displays

The gift-shop idea is spreading rapidly and the gas companies are the last to take it up. The Baltimore (Md.) Gas & Electric Light Company has established a "light studio," which they feature in their ads and by beautiful window displays. During midwinter people are more inclined to listen to lamp talk, as artificial light is required for so large a percentage of the time. Aware of this, the Baltimore company took occasion to remind the public of coming birthdays and anniversaries, as follows:

When One's Thoughts Turn Giftward

the Light Studio is especially serviceable.

No gift would be more appreciated, no gift more serviceable and lasting, than a lamp, fixture or shade, selected in our beautiful Light Studio—floor lamps, piano lamps, table lamps, boudoir lamps.

They backed up their "light studio" with a couple of attractive windows—one fitted up as a den, the other as a living room—in both of which lamps, shades and fixtures bore a prominent part. The former was especially beautiful, the dainty outfittings doing much to suggest gas lamps and fixtures as gifts. The furniture was of ivory enamel, with a divan draped with rose-hued silk. Many pillows of the same hue were strewn about the divan and on the floor. On a stand close by were a lamp with rose-hued shade, an open book and a dish of chocolates. On the dressing table at the other end of the room was a boudoir lamp with silk shade and a set of ivory toilet articles. In the center of the room was a tall floor lamp with wide spreading shade of pink silk. Masses of pink and white sweet peas were used for decoration, being placed in vases on the stand and dressing table, as well as in a large flower bowl. A card suggested:

If you would have the Easter bride lead a roseate existence—buy her one of these handsome stand or floor lamps.

The college girl or boy would also be glad to have one for the den. Many colors of shades and fixtures from which to choose.

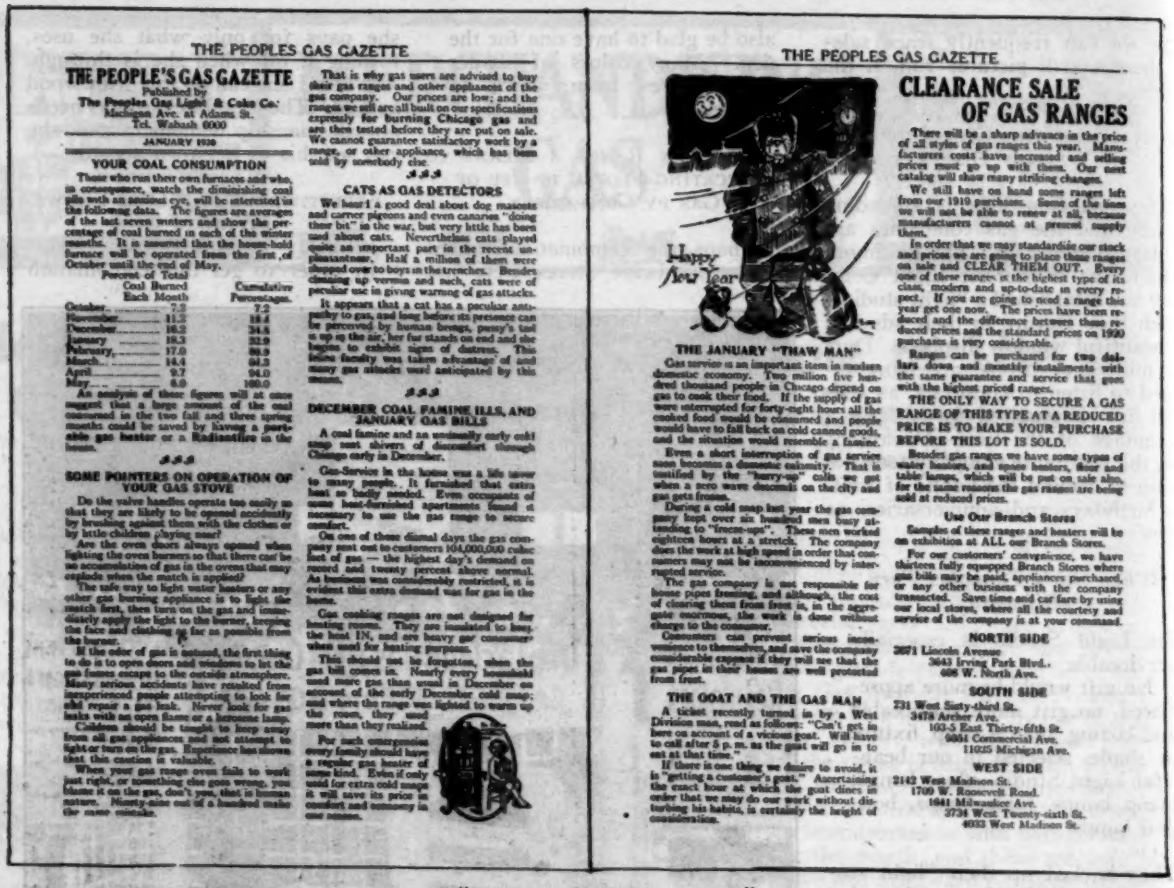
Combination Range a Means to Educating People to Use of Gas by Comparison

Perhaps the combination ranges sold by hardware stores were not built for the purpose of showing the superiority of gas, but they certainly do this most effectively, and it would pay any gas concern to carry a few of them in stock. The average man or woman accustomed to the use of coal or wood offers the objection that gas will not give out sufficient heat and that it is expensive. Instead of trying to argue them out of this, simply use your salesmanship in selling them a combination range. With this they can cook and heat in the old way, and also with gas. The first warm day the housewife is pretty sure to try the gas way, and a single day will convince her of the superiority of this fuel. She will find that it cooks not only as well but far better, as the heat is even; and she will find that instead of being expensive it is really economical, as she pays for only what she uses, turning it off when she is through. Ask her if she can do this with wood or coal. The cleanliness of gas needs no salesmanship demonstration—she can see this of her own accord.

Effectiveness of a Good Show Window

In order to get this combination range before the buying public there is no agency so effective as a good show window. Bings, of Cleveland, Ohio, recently had such a one—the spotlessness and shining brightness of all the accessories produced a very favorable impression upon passers-by, while the catchy cards served to pound home in pithy phrases the advantage of the stove. Linoleum covered the floor, and the walls were of sanitas. Three combination ranges were shown, with a card on top of the central one: "Demonstration of This Wonderful Three Fuel Range." Stands made of lath, painted orange, had tacked to them a series of cards of sky-blue and orange lettered in black: "Four covers for coal and wood," "Draft controller, damper," "Porcelain gas cocks, adjustable air mix-

ONE OF THE WINDOWS OF THE LACLEDE GAS LIGHT COMPANY OF ST. LOUIS, MO.



THE PEOPLES GAS GAZETTE

THE PEOPLE'S GAS GAZETTE

Published by
The Peoples Gas Light & Coke Co.
Michigan Ave. at Adams St.
Tel. Wabash 6000

JANUARY 1920

YOUR COAL CONSUMPTION

Those who run their own furnaces and who, in consequence, watch the diminishing coal pile with an anxious eye, will be interested in the following data. The figures are averages of the last seven winters and show the percentage of coal burned in each of the winter months. It is assumed that the house-hold furnace will be operated from the first of October until the end of May.

	Percent of Total Coal Burned Each Month	Cumulative Percentages.
October	7.2	7.2
November	11.5	18.4
December	16.2	34.6
January	18.3	52.9
February	17.0	69.9
March	14.4	84.3
April	9.7	94.0
May	6.0	100.0

An analysis of these figures will at once suggest that a large amount of the coal consumed in the two fall and three spring months could be saved by having a portable gas heater or a Radiantfire in the house.

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SOME POINTERS ON OPERATION OF YOUR GAS STOVE

Do the valve handles operate too easily so that they are likely to be opened accidently by brushing against them with the clothes or by little children playing near?

Are the oven doors always opened when lighting the oven burners so that there can be no accumulation of gas in the ovens that may explode when the match is applied?

The safe way to light water heaters or any other gas burning appliance is to light the match first, then turn on the gas and immediately apply the light to the burner, keeping the face and clothing as far as possible from the burner.

If the odor of gas is noticed, the first thing to do is to open doors and windows to let the gas fumes escape to the outside atmosphere. Many serious accidents have resulted from inexperienced people attempting to look for and repair a gas leak. Never look for gas leaks with an open flame or a lucesene lamp.

Children should be taught to keep away from all gas appliances and not attempt to light or turn on the gas. Experience has shown that this caution is valuable.

When your gas range oven fails to work just right, or something else goes wrong, you blame it on the gas, don't you, that is human nature. Ninety-nine out of a hundred make the same mistake.

That is why gas users are advised to buy their gas ranges and other appliances of the gas company. Our prices are low; and the ranges we sell are all built on our specifications expressly for burning Chicago gas and are then tested before they are put on sale. We cannot guarantee satisfactory work by a range, or other appliance, which has been sold by somebody else.

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CATS AS GAS DETECTORS

We hear I a good deal about dog mascots and carrier pigeons and even canaries "doing their bit" in the war, but very little has been said about cats. Nevertheless cats played quite an important part in the recent unpleasantness. Half a million of them were shipped over to boys in the trenches. Besides cleaning up vermin and such, cats were of peculiar use in giving warning of gas attacks.

It appears that a cat has a peculiar antipathy to gas, and long before its presence can be perceived by human beings, pussy's tail is up in the air, her fur stands on end and she begins to exhibit signs of distress. This fellow faculty was taken advantage of and many gas attacks were anticipated by this means.

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DECEMBER COAL FAMINE ILLS, AND JANUARY GAS BILLS

A coal famine and an unusually early cold snap sent shivers of discomfort through Chicago early in December.

Gas-Service in the homes was a life saver to many people. It furnished that extra heat so badly needed. Even occupants of some heat-furnished apartments found it necessary to use the gas range to secure comfort.

On one of those dismal days the gas company sent out to customers 104,000,000 cubic feet of gas — the highest day's demand on record and twenty percent above normal. As heating was considerably restricted, it is evident this extra demand was for gas in the home.

Gas cooking ranges are not designed for heating rooms. They are insulated to keep the heat IN, and are heavy gas consumers when used for heating purposes.

This should not be forgotten, when the gas bill comes in. Nearly every household used more gas than usual in December on account of the early December cold snap; and where the range was lighted to warm up the room, they used more than they realized.

For such emergencies every family should have a regular gas heater of some kind. Even if only used for extra cold snaps it will save its price in comfort and economy in one season.

THE PEOPLES GAS GAZETTE

THE JANUARY "THAW MAN"

Gas service is an important item in modern domestic economy. Two million five hundred thousand people in Chicago depend on gas to cook their food. If the supply of gas were interrupted for forty-eight hours all the cooked food would be consumed and people would have to fall back on cold canned goods, and the situation would resemble a famine.

Even a short interruption of gas service soon becomes a domestic calamity. That is testified by the "hurry-up" calls we get when a zero wave descends on the city and gas gets frozen.

During a cold snap last year the gas company kept over six hundred men busy attending to "freeze-ups". These men worked eighteen hours at a stretch. The company does the work at high speed in order that consumers may not be inconvenienced by interrupted service.

The gas company is not responsible for house pipes freezing, and although, the cost of clearing them from frost is, in the aggregate enormous, the work is done without charge to the consumer.

Consumers can prevent serious inconvenience to themselves, and save the company considerable expense if they will see that the gas pipes in their homes are well protected from frost.

THE GOAT AND THE GAS MAN

A ticket recently turned in by a West Division man, read as follows: "Can't get in here on account of a vicious goat. Will have to call after 5 p. m. as the goat will go in to eat at that time."

If there is one thing we desire to avoid, it is "getting a customer's goat." Ascertaining the exact hour at which the goat dines in order that we may do our work without disturbing his habits, is certainly the height of consideration.

CLEARANCE SALE OF GAS RANGES

There will be a sharp advance in the price of all styles of gas ranges this year. Manufacturers costs have increased and selling prices must go up with them. Our next catalog will show many striking changes.

We still have on hand some ranges left from our 1919 purchases. Some of the lines we will not be able to renew at all, because manufacturers cannot at present supply them.

In order that we may standardize our stock and prices we are going to place these ranges on sale and CLEAR THEM OUT. Every one of these ranges is the highest type of its class, modern and up-to-date in every respect. If you are going to need a range this year get one now. The prices have been reduced and the difference between these reduced prices and the standard prices on 1920 purchases is very considerable.

Ranges can be purchased for two dollars down and monthly installments with the same guarantee and service that goes with the highest priced ranges.

THE ONLY WAY TO SECURE A GAS RANGE OF THIS TYPE AT A REDUCED PRICE IS TO MAKE YOUR PURCHASE BEFORE THIS LOT IS SOLD.

Besides gas ranges we have some types of water heaters, and space heaters, floor and table lamps, which will be put on sale also, for the same reasons the gas ranges are being sold at reduced prices.

Use Our Branch Stores

Samples of these ranges and heaters will be on exhibition at ALL our Branch Stores.

For our customers' convenience, we have thirteen fully equipped Branch Stores where gas bills may be paid, appliances purchased, or any other business with the company transacted. Save time and car fare by using our local stores, where all the courtesy and service of the company is at your command.

NORTH SIDE

2871 Lincoln Avenue
3643 Irving Park Blvd.
608 W. North Ave.

SOUTH SIDE

231 West Sixty-third St.
3478 Archer Ave.
103-5 East Thirty-fifth St.
9351 Commercial Ave.
11025 Michigan Ave.

WEST SIDE

2142 West Madison St.
1709 W. Roosevelt Road.
1641 Milwaukee Ave.
2724 West Twenty-sixth St.
4033 West Madison St.

INSIDE PAGES OF THE FIRST NUMBER OF "THE PEOPLES GAS GAZETTE," WHICH IS SENT OUT BY THE PEOPLES GAS LIGHT & COKE COMPANY, OF CHICAGO, TO CONSUMERS WITH THE MONTHLY GAS BILL

tures," "Self-starter for coal, no kindling," "A simple twist changes oven from coal to gas," "Broiling and toasting compartment," "Warming closet compartment," "Oven 18x 18 inches for coal, wood and gas," "Automatic fume damper—no odor in kitchen," and "Fume damper for gas and dampers for coal." At one side was a tall panel card on which were printed the names and addresses of people in Cleveland and vicinity who had purchased one of the ranges. Space was left at the bottom and new names were added from time to time as additional purchases were made. Each afternoon a demonstration was given of the efficiency of the gas portion of the stove—a domestic science instructor baking biscuits and pies, tea and coffee. A booth was fitted up for this purpose, and cards in the newspapers, as well as the one in show window, invited the public to come in and see the efficacy of the gas part of the stove. "You have tried Wood and Coal—Now try Gas" read a big sign across the booth.

Ralph Elsman Gives First of a Series of Addresses in Territory of His Company

Ralph Elsman, vice-president and general manager of the Kings County Lighting Company, of Brooklyn, N. Y., gave an address before the Bay Ridge Chamber of Commerce on the subject of "The Relation of a Public Utility to the Development of a Community." This is the first of a series of addresses that Mr. Elsman will give before various civic and other organizations in the territory served by his company.

The presiding member of the Chamber of Commerce, at the close of Mr. Elsman's address, said that when the public were informed of the problems of its gas company it would assume a more generous attitude toward that company.

In his address Mr. Elsman told of the development work of the Kings County Lighting Company, and compared the years of 1914 and 1916 with present existing conditions, stating that those who talked in the figures of 1914 were, as had been aptly put by Prof. Irving Fisher of Yale, "speaking in a dead language."

Peoples Gas Deal for New Plant Progressing

The proposed deal between the Peoples Gas Light & Coke Company, of Chicago, Ill., and the Koppers Company, of Pittsburgh, Pa., looking toward the erection of a $15,000,000 coal-gas plant for the Peoples company in Chicago, still is under way. Samuel Insull, chairman of the Peoples Gas Company, stated recently that "the negotiations are very active indeed." The projected plant, which must be built this summer, will increase the capacity of the Peoples company 50 per cent. It is understood negotiations are on a basis that the new plant will be built by Eastern capital and leased to the Peoples company for a term of years, at the expiration of which the gas company would have an option to purchase it at a set price.

President Albert M. Barnes' Address Before the 49th Annual Meeting of the New England Association of Gas Engineers

It is my great privilege, and equally a great pleasure, to welcome you to the forty-ninth annual meeting of this highly respected New England Association of Gas Engineers, and in extending this greeting I wish especially to emphasize the fact that it is *only* the *forty-ninth* annual meeting!

The association was organized in February, 1871, and the first annual meeting was held in February, 1872; consequently, only forty-eight annual meetings could have been held prior to 1920. "Q. E. D."

Error in Record

Examination of the records of the association discloses the fact that the annual meeting in February, 1887, was erroneously recorded as the seventeenth annual meeting. Of course, it is unnecessary to say that Nat Gifford was not secretary at that time, but the error once started was carried along through succeeding years without causing any comment. So long as the members had the usual yearly opportunity for the exchange of ideas and for social intercourse, the numerical designation of the meeting made no difference in the general result and no particular attention was paid to that minor detail; but as we approach an important epoch in our history it does seem essential to correct the error and not put ourselves in the position of claiming more honor than properly belongs to us. Therefore, the directors have decided that the correction shall be made at this time.

It is gratifying to note from the report of the directors that the increasing years of the association bring with them increasing numbers of those interested in and helpful in carrying forward its good work. The new blood is sure to add new energy to the life of the association and will help to maintain it where it has always stood at the head of all similar associations.

We suffer a great loss in the death of such men as John A. Gould, C. J. R. Humphreys and John P. Kennedy, who for many years had taken an active part in our proceedings; Mr. Humphreys since 1885, Mr. Gould since 1895 and Mr. Kennedy since 1908. I have asked certain of our members who were well acquainted with these men to prepare tributes of respect to their memory, to be presented to you for adoption later in the proceedings.

Work of American Gas Association

In his excellent address last year President Norcross called our attention to the prospectus of the newly organized American Gas Association, and urged us to do our part toward making it a success. Those of us who attended the convention in New York last October could not fail to be impressed with the scope of its work, the enthusiasm which prevailed, and the great interest aroused in the work of the various sections, and we came home filled with new ideas and inspired to greater efforts for the success of the industry. Following Mr. Norcross' example, I most earnestly urge those who have not already done so to become members of that association, not alone for the many benefits you and the companies you represent will derive from it but also with the idea that you can and will do something to promote and extend its usefulness. There stands a splendid aggregation of the leaders in every branch of the industry, ready and willing to help you in any of your problems and your difficulties, waiting with outstretched hands to welcome you. Let's go!

Under the conditions of our federation agreement we are entitled to representation on the managing committee of each of the six sections of the American Gas Association, and the present incumbents of those positions are as follows: Technical section, Clifford E. Paige; commercial section, Harry C. Crafts; manufacturing section, David C. Eccles; advertising section, Andrew A. Higgins; accounting section, your humble servant.

Mr. Eccles was appointed to fill the vacancy caused by the election of Harry A. Norton as a director of the association.

This patronage is a perquisite of the president of the New England association, and, so far as I have been able to discover, the only perquisite attaching to the office, so in the distribution of that patronage I shall exercise my prerogative by reappointing all the present incumbents except myself and by substituting in my place as representative on the managing committee of the accounting section Walter F. Norton.

Scope of Program of This Meeting

The program presented at this meeting for your consideration is one that deserves your careful attention. The leading papers are upon subjects of vital importance to the industry, and the names of their authors are a sufficient guarantee of well-considered treatment. What is particularly requested for them is that they may lead to a full and free discussion; for the real benefit of these meetings lies in the interchange of individual ideas and opinions upon the various matters brought before you.

Urges Younger Men to Present Their Views

Particularly would I urge the younger men to present their views. In the words of the Scriptures, "Your old men shall dream dreams and your young men shall see visions." As a rule these young men bring to the industry a mind trained to observe and to draw their conclusions from what they observe. They are free from the trammels of long-established practice, and are therefore quick to detect any weakness or failing in the old accepted methods. Suggestions from such men may perhaps open new lines of thought and a broader field for discussion, which cannot but bring good results.

Past Year in Retrospect

It seems to have been the general custom in previous years for the president, in his address, to review in more or less detail the principal events of his term of office. In a retrospect of the year just ending perhaps the less said the better and the sooner it will be forgotten; but we are not likely to forget the coal strike, for some of us were caught with small stocks of coal and by reason thereof suffered more or less anxiety. So far as I am informed, however, no gas company was com-

pelled to shut down. The coal committee which acted for the association the previous year promptly took hold of the situation and were ably assisted in their work by Dr. John F. Wing, with whose skillful handling of the situation in the previous stringency you are all familiar. Under his leadership we succeeded in securing for the New England gas companies a very large percentage of the coal en route to them which had been held up by the Railroad Administration. In this connection our thanks is also due to James J. Storrow, who cheerfully responded to our requests for his aid, and to the National Committee on Gas and Electric Service, who promptly reopened its Washington office and again rendered good service in the protection and advancement of the interests of the lighting industry. We are by no means out of the woods yet, however, and if existing traffic conditions, with the attendant embargoes, do not show early and marked improvement, the good Doctor's services are likely to be in demand again, and undoubtedly he will respond to the call with similar promptness and skill.

Existing conditions in general are far from satisfactory. The large profits in nearly all lines of general business and the high wages paid to labor have developed a period of reckless extravagance. Fur coats, pianos, automobiles and diamonds are becoming necessities instead of luxuries, and shorter hours with lessened efficiency tend to curtail the production and supply of the important essentials.

Increasing Costs of Materials

In the gas industry we face steadily increasing costs of coal, oil and all other materials, and insistent demands on the part of labor for higher wages. It may be possible by maintaining prompt and efficient service and by intelligent and persistent efforts so to extend the use of gas and increase our sales as to offset in some measure the increased cost of manufacture and distribution. Failing this, we have no other recourse than an increase in our rates; and so far as an increase in rates may be found necessary to cover these increased costs and enable us to make a reasonable return to our stockholders, so far should we insist upon having them, even to the court of last resort.

Looking forward into the future one finds little encouragement for better conditions. Present values of all commodities are very much inflated, with the demand in excess of the supply. Sooner or later this will right itself, but how or when? A sharp falling off in demand would produce a glut in the market and possibly result in a panic. That, of course, is to be deplored, and averted if possible. Far better would be a move on the part of individuals toward greater economy and less reckless expenditure. This movement once started will work its own cure; supply will gradually overtake demand and prices will gradually find a lower level.

The Labor Situation

The labor situation, however, seems to be lacking such desirable possibilities. Labor by and through its organizations is to-day seeking a larger share in the results of industry, and is likely to get it. The radical element aims not alone at the control of industry but of the Government as well, and in view of some of its demands already made in respect of the management of the railroads we may well fear the results of such control.

No one questions the right of labor to organize for the protection of the individual worker and to secure just and proper compensation for the service rendered, and we must also admit the justice of the principle of collective bargaining so long as it is carried on between the employer and his own employees; but there should be provided, and I am confident there will be provided, some system of tribunal appeal by means of which all differences of opinion or grievances may be investigated without resorting to strikes or lockouts, especially in the case of public service corporations.

These industries are chartered to serve the public; they are under Government control and regulation, and are required to operate continuously. In the same way the employees of such corporations should be so regulated and controlled that *they* cannot interrupt that service to the detriment, comfort or convenience of the community.

Court of Industrial Relations Established in Kansas

I note that at a session of its legislature specially called for that purpose the State of Kansas has created a court of industrial relations, with authority to hear and determine all controversies which may arise and which threaten to hinder, delay or suspend the operation of industries directly or indirectly affecting the supply of food, clothing, fuel and transportation; and a public hearing is being held at our State House this morning upon a bill for the establishment of a similar bureau in Massachusetts.

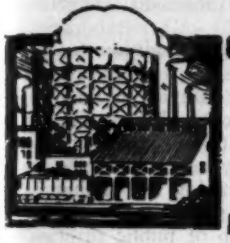
It is also gratifying to note that President Wilson appears to have taken a firm stand in favor of this method of settling the pending controversy between the Administration and the railway employees, and that the brotherhood officials, seeing the handwriting on the wall, show a disposition, reluctant and unwilling though it be, to comply with the wishes of the President.

Public sentiment is steadily tending in this direction, and when sufficiently aroused will insist upon some such protection from the interruption of a service so essential to its daily convenience. We, on our part, should endeavor to foster and encourage public support for some such plan, and should try to impress upon our employees that it is likewise for their benefit and does not infringe upon their rights as individuals. If all the facts pertaining to these differences can be ascertained and made known by an impartial tribunal, public opinion may be trusted to see that they are settled fairly and justly to both sides. The interest of any one class must not be allowed to overrule the interest of all. When one class in any community can say to every other class, "You shall have no light or fuel unless you pay us what *we* think we ought to have," we no longer have a democratic form of government.

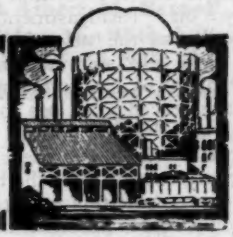
The period of unrest we are passing through is but the logical outcome of a world-wide war which has upset the pre-war political and economic conditions and in large measure unsettled even the foundations of Christianity. The problems of reconstruction are many and the process of readjustment must necessarily be long drawn out and slow of accomplishment.

The winter of our discontent is universal, and we wait longingly for some son of York, or perhaps Massachusetts, to bring back the glorious summer of the pre-war period. It is not the discontent of the hungry or oppressed, but finds its source largely in the radical elements of society, who argue that former conditions were unequal and unjust, and

(*Continued on page 21 of Advertising Section.*)



NEWS OF THE GAS INDUSTRY



France Experimenting with Wood in Production of Gas

The more extensive use of wood as fuel in the production of gas has been urged by the authorities of France because of its cheapness and also because of the scarcity of coal.

These experiments with wood for the production of gas have not been uniformly successful, according to reports which have just been published on the experiments made.

A director of one of the companies which have been conducting extensive experiments with the use of wood to produce gas says he has found that such gas gives off an emulsion which attacks sheet iron and eats through it, thus making it necessary to renew manufacturing machinery more frequently than otherwise would be necessary.

Tests continue, however, and French manufacturers are trying hard to find a satisfactory substitute for coal.

Rochester Corporation Manufactured 2,675,978,000 Cu. Ft. of Gas in 1919

Dn Dec. 15, 1919, at the plant of the Rochester (N. Y.) Gas & Electric Corporation occurred the maximum gas sendout for 1919—9,820,000 cu. ft., which, the company reports, is very nearly a million greater than the 1918 peak of 8,763,000, but it is more than 100 per cent higher than the peak of 1919, which was 4,761,000.

The total gas made during 1919 was 2,675,978,000 cu. ft., an increase of one hundred and seventeen million over 1918, or 4.6 per cent. The ratio of total make to the maximum day was 273.

As the ratio between the year total and the maximum day approaches 300, it is evident that the coal is stabilizing itself by filling the valleys and cutting down the peaks. In 1917 and 1918 the ratios were 291 and 292, respectively, the best ever attained by the Rochester company.

Forty-Ninth Annual Meeting of the New England Association of Gas Engineers an Enthusiastic One

Ole Hansen Addresses Meeting and Speaks on Results of Municipal Ownership in Seattle

The forty-ninth annual meeting of the New England Gas Engineers' Association was held at the Copley-Plaza Hotel, Boston, Mass., Feb. 17 and 18. The attendance was not as large as had been expected, as many of the members were unable to leave on account of illness among their forces. However, over 150 were on hand, and what the meeting lacked in numbers it more than made up in enthusiasm.

The meeting was a very successful one, and every gas man present got valuable ideas which he can use in the operation of the departments of his plant.

The president's address covered many subjects. He referred to the big work being done by the American Gas Association, and urged all who had not already done so to join that association.

Touching on the labor situation, he said: "No one questions the right of labor to organize for protection of the individual worker and to secure just and proper compensation for the service rendered, and we must all admit the justice of collective bargaining so long as it is carried on between the employer and his own employees; but there should be provided some system of tribunal appeal by means of which all differences of opinion or grievances may be investigated without resorting to strikes and lockouts, especially in the case of public service corporations.

"These industries are chartered to serve the public; they are under Government control and regulation, and are required to operate continually. In the same way the employees of such corporations should be so regulated and controlled that they cannot interrupt that service to the detriment, comfort or convenience of the community."

The Boston Chamber of Commerce sent a communication to the association regarding its attitude on daylight saving. A committee previously appointed to consider the question reported that while the plan would entail some sacrifice on the part of gas companies, yet it was unanimously decided that the association should go on record as being in favor of national daylight saving.

In this connection Col. O. H. Fogg, secretary-manager of the American Gas Association, stated that he did not know of a single gas company that was against this plan, and the best information he had was that the loss to gas companies under this plan would be negligible.

The first paper was read by H. Howard Smith, industrial gas engineer of the Citizens' Gas Light Company, Quincy, Mass., the subject of which was "Some Notes on Use of Gas in Brass Foundry." In the discussion it was brought out that where crucibles are used they last twice as long with gas as a fuel as with oil, and that a higher quality of metal is produced.

Another interesting paper was one by A. A. Higgins on "Advertising." Before reading his paper Mr. Higgins suggested that it would be a good plan for the gas companies to use some space in their local papers announcing the fact that they are not opposed to the daylight-saving plan.

H. L. Nickerson read a paper entitled "Diminution of Waste Heat Losses in Water Gas Operation," which contained valuable information on this subject obtained by careful tests.

A paper by G. H. Priest, general

manager of the Brockton Gas Company, on "Readjustment of Gas Rates" was the most important of the day. He showed that a large percentage of gas company customers are served at a loss to the company, and that this burden had to be carried by the larger users. A service charge seems to be the best method to overcome this condition, for it not only forces the small user to pay the cost of the service but permits a reduction in the charge per 1,000 cu. ft. of gas.

In the discussion it was brought out that several companies had made a careful investigation and had found that over a third of their users were being served at a loss to the company. It was stated that the matter of permitting a service charge by gas companies was up now before the Massachusetts State Legislature.

H. N. Cheney, engineer of construction of the Boston Consolidated Gas Company, read a most interesting paper on "Repairing an Unusual Break."

The banquet was held Wednesday evening. Charles W. Elliot, president emeritus of Harvard University, was the chief speaker. He reviewed briefly the history of the gas business during his life. His most pertinent remarks related to labor. He advocated co-operative management, profit sharing and protection of labor through proper housing, accident and health supervision on the part of the employers. In the way of legislation, he urged laws to prevent strikes in public utilities.

Captain W. E. McKay was the toastmaster. Alexander MacGregor, of Harris, Forbes & Co., gave a graphic idea of the present financial plight of utilities. Alonzo Weed, chairman of the Massachusetts Utilities Commission, gave the history of the State commission. Oscar Fogg spoke on the work of the A. G. A.

Second Day of Meeting

On Thursday the first paper read was "Lighting of Nashua, N. H., High School Building," by W. F. Norton, second vice-president of the Manchester Traction, Light & Power Company, Nashua, N. H.

Gas lighting is a subject that is always uppermost in the minds of gas men, and this paper was very freely discussed. There is no doubt but what a large amount of lighting business can be secured especially for public buildings, school buildings, stores, factories, etc.

Mr. Nute, of the Fall River Gas Works, told how completely and satisfactorily they are lighting the schools of Fall River.

The suggestion was made that electric light users be urged to equip for gas lighting also as an auxiliary to their electric lighting, for it frequently happens that the electric service is stopped for a time through some cause, and this frequently happens, and if the stores especially were equipped with gas lighting the inconvenience would be slight.

Discussion of Coal-Gas Results

A "Compilation of Statistics on Coal-Gas Results in New England," consisting of "Horizontal" results by R. E. Wyant, engineer and superintendent of the New Haven Gas Light Company; "Vertical" results by H. von Vittinghoff, Boston; "Oven" results by F. C. Freeman; "Inclined" results by C. E. Paige, superintendent of the Malden & Melrose Gas Company, was presented by Mr. Paige, chairman of the committee. A chart for each system was prepared showing the period covered in each test. The horizontal chart gives type of benches, system, normal gas production, normal carbonizing capacity, number of benches, number of retorts per bench, size of retorts, kind of material, type of producer and kind of grate, depth of producer fuel, average number of retorts in use, per cent of rating secured per bench, average weight per charge, average weight per charge per foot of retort, length of carbonizing period, per cent of decarbonizing time of total retort hours, capacity loss due to scurfing, temperature of combustion chamber, temperature around retort, temperature outlet recuperation, how temperatures are taken, also kind of coal used, and complete data on output, candle-power, etc. All of these charts will be published in a later issue of the Journal.

At the discussion of the coal-gas results paper there was a strong feeling that all methods are essentially the same in the make of gas. One man thought that the future development of the business would be in the line of building more by-product plants. Another man thought that separate by-product plants organized as independent companies should be organized. They would be independent of commission control and could sell gas to the gas companies for distribution at fixed rates.

Ole Hansen Addresses Meeting

An unannounced addition to the program was a short address by Ole Hansen, former Mayor of Seattle, Wash. His talk was largely on the results of the taking over of the street railway system of Seattle by the city. He frankly stated that in the beginning he was in favor of municipal ownership of public utilities, but that this experience in Seattle had convinced him that it was a mistake. The best results were obtained by private ownership, he declared, and he recommended that all public utility corporations place before the community they serve the conditions under which they operate, and, in fact, all matters of operation, so that the people will have a better understanding of the whole situation and thus remove to a large extent an antagonism that has been allowed to grow up in a large number of communities against public service corporations. He stated that he had hoped when the street railway system of Seattle had been taken over by the city that it would take the proposition out of politics, but instead of that it had become the football of politics.

Treasurer's Report

The report of the treasurer, M. W. Gifford, showed that the association is in a healthy financial condition.

The association lost three members through death during the past year. These members were: John Gould, of the Boston Consolidated Gas Company; J. L. Kennedy, of the Cambridge Gas Light Company, and C. J. R. Humphreys, of the Lawrence Gas Company. Proper resolutions were placed on the records of the association and copies ordered sent to the families of the deceased.

The following officers and directors were elected for the coming year:

President—N. F. Norton, second vice-president Manchester Traction, Light & Power Company, Nashua, N. H.

First Vice-President — Burton Smart, treasurer Portland Gas & Electric Company, Portland, Me.

Second Vice-President — V. E. Bird, manager New London Gas & Electric Company, New London, Conn.

Secretary and Treasurer—John L. Tudbury, manager Salem Gas Light Company, Salem, Mass.

Directors—H. N. Cheney, engi-

neer of construction, Boston (Mass.) Consolidated Gas Company; R. E. Wyant, engineer and superintendent, New Haven (Conn.) Gas Light Company; C. E. Paige, superintendent, Plymouth (Mass.) Gas Company; C. R. Prichard, superintendent, Beverly (Mass.) Gas & Electric Company; W. B. Nichols, president Citizens' Gas Company, Quincy, Mass.

The retirement of Nathaniel W. Gifford was regretted by everyone. Mr. Gifford has been secretary and treasurer of the association for twenty-one years, and its success during this period has been largely due to his interest in the gas industry and his belief in the great benefits to the industry derived through the New England Gas Engineers' Association. A rising vote of thanks was given Mr. Gifford in recognition of his services.

Los Angeles G. & E. Wins Gas Rate Suit

An injunction suit started by the Los Angeles (Cal.) Gas & Electric Company to halt enforcement of rates set by the city in 1914-15 has been terminated in United States District Judge Trippet's court and the corporation has been granted the restraining order asked. The price scale, made prior to the railroad commission being given jurisdiction in the matter, was 40 cents per 1,000 cu. ft. for natural gas and 52 cents for mixed gas. When the suit was filed the city postponed from time to time enforcement of the charge and the rate was never enforced.

Northern Indiana G. & E. Co. Asks for Increased Rates

The Northern Indiana Gas & Electric Company, with main office at Hammond, Ind., has filed petitions with the public service commission for authority to increase gas rates at Crawfordsville, Michigan City and Plymouth, Ind.

The commission received a petition from the Indiana Utilities Company, with main office at Angola, for authority to issue and sell $30,200 of general mortgage bonds to buy additional equipment and to reimburse the company for $4,300 expended.

The petition says the improvements are necessary to provide for demands of the consumers at Angola, Fremont, Ashby, Hudson, Waterloo and Pleasant Lake, Ind.

Would Sell Plant of Ashtabula Gas Company

F. W. Stone, manager of the Ashtabula Gas Company, at a meeting of the Ashtabula (Ohio) City Council, in discussing the gas outlook in that city made a statement in which he said that manufactured gas would cost $1.50 per 1,000 cu. ft. He offered to sell the distributing plant of the Ashtabula Gas Company to the city for $380,000, if the city is interested in building and operating a manufactured gas plant.

Government Experts to Make Survey of Gas Supply

E. W. Shaw, of the United States Geological Survey, is in Dallas, Tex., for the purpose of a survey to determine the location of gas available to Dallas for commercial purposes. He is accompanied by P. L. Ports, who will make the survey under the supervision of Mr. Shaw. Mr. Ports is valuation engineer for the Treasury Department and is a gas expert.

Mr. Shaw made a survey of the Petrolia field four years ago. He predicted then that oil or gas, or both, would be found in West Texas in large quantities.

Mr. Shaw will cover in his report both the location of gas in the known fields and in prospective fields that could be drilled in Dallas profitably.

Natural Gas Association of America Plans Big Meeting

Initial steps in development plans for the coming annual joint convention of the Natural Gas Association of America and the Association of Natural Gas Supply Men, to be held in Buffalo, N. Y., May 17 to 20, inclusive, were taken at a meeting attended by B. C. Oliphant, president of the Natural Gas Association of America; Millia B. Way, of Pittsburgh, secretary of the association, and Larmour Adams, of Erie, secretary of the Association of Natural Gas Supply Men.

This meeting will be conducted along the broad lines of public interest in the solution of the city's and country's problems connected with natural gas. The exhibition will contain more than 130 appliance manufacturers' products.

Indications already point to the fact that last year's attendance at Cleveland, at which 1,850 delegates were registered, will be exceeded by this open show at Buffalo.

President Albert M. Barnes' Address Before the 49th Annual Meeting of the New England Association of Gas Engineers

(*Continued from page* 154.)

that the present is a favorable opportunity to uproot and overturn those conditions in the hope of greater personal gain to themselves.

Alarming as are the possibilities of the situation, there are hopeful and encouraging indications that the sound common sense of the great public will carry us safely through the impending dangers. Massachusetts, with her 124,000 plurality for Coolidge last November, placed herself strongly on record in favor of law and order, and was warmly applauded for it throughout the country; and the outcome of the steel strike and the coal strike warrants our faith in the continuance of a free opportunity for all for the enjoyment of life and liberty and the pursuit of happiness.

In one of his earlier poems James Russell Lowell said:

"New times demand new measures and new men;
The world advances and in time outgrows
The laws that in our fathers' day were best;
And, doubtless, after us some purer scheme
Will be shaped out by wiser men than we,
Made wiser by the steady growth of truth. * * *
Truth is eternal, but her affluence,
With endless change, is fitted to the hour;
Her mirror is turned forward, to reflect
The promise of the future, not the past."

More than ever before we need wise men, and clear-thinking men, who shall correctly interpret the promise of the future, now so dimly outlined in Truth's mirror and so clouded by the mists of doubt and uncertainty; but we must not, and I am confident we shall not, waver in our faith that the final development of the picture will bring out, clearly and distinctly, the purer scheme resulting from the steady growth of truth.

Construction Notes

Committee Approves $2,000,000 Bond Issue for Improvements at Richmond Gas Works

A bond issue to provide $2,000,000 for the improvement of the municipal gas works at Richmond, Va., and install a new central fire-alarm system was recommended by the council committee on finance at a meeting recently. The cost of the fire-alarm system is estimated at $40,000.

The bond issue was recommended without a dissenting vote, after Director of Public Utilities Trafford had stated that gas service would be severely crippled unless the work of improving the plant was begun soon and Director of Public Safety Myers had pointed out the dangerous inefficiency of the present fire-alarm system.

Mr. Trafford said about $12,000 would be needed to begin work at once at the gas plant, and pointed out that the gas business had increased 96 per cent in the last few years. He said it was necessary to take immediate steps toward improving the plant to assure adequate service next winter.

1,200 Ft. Main "Launched" at Oakland

The new 1,200-ft. gas main of the Pacific Gas & Electric Company has been launched in the Oakland, Cal., estuary. The main will be a new supply system leading from the Oakland service plant to the Alameda distribution system. Three additional sections, weighing 10 tons each and being 300 ft. in length, will be built on the shore, launched on special barges, and sunk in place in the same manner as the 1,200-ft. section that has been launched.

The center or connecting part will be assembled on floating barges and dropped into place and the connections secured under water.

The cost of the construction work amounts to $20,000. Such a launching on a smaller scale was experimented with six months ago with the laying of the Park Street main.

Beaumont Gas Company Plans $150,000 Improvements

The Beaumont (Tex.) Gas Company has announced that it will begin immediately a system of improvements to its plant and extensions which will cost approximately $150,000. The contract has already been let for another gasometer and about 6,000 ft. of 10-in. mains laid.

Valdosta Gas Company Making $50,000 Enlargements

Extensive enlargements and improvements in the plant of the Valdosta (Ga.) Gas Company have commenced. Much of the new machinery to be installed is now on the ground and in transportation, and the enlarged plant will probably be finished during the early summer. The company will spend $50,000 in improvements, which it believes will take care of increased demands on it for a number of years.

ADVERTISEMENT

Bids: March 10, 1920.

STEAM POWER PLANT and WATER GAS PLANT EQUIPMENT, Tallahassee, Fla.

Sealed proposals will be received by the Board of Commissioners of the City of Tallahassee, Fla., at the City Hall until 4:00 o'clock P. M. of Wednesday, March 10, 1920, for furnishing and erecting steam and gas plant apparatus, as follows:

STEAM PLANT EQUIPMENT

1—500 K.W. Steam Turbine
2—Condensers
2—225 H.P. Water Tube Boilers
Superheaters
Feed Pumps
Feed Water Purifying System
Spray Cooling System
Motor Generator Set

CARBURETTED WATER GAS PLANT APPARATUS

10,000 cu. ft. per hour Generator
Carburetor
Superheater
Boiler
Scrubber
Hydraulic Seal
Purifier
Blower
Gas Storage Tanks
Oil Storage Tanks
Pumps, Piping, Gauges, etc.

Each proposal must be accompanied by a certified check in the sum of 10 per cent of the amount bid, made payable to the Board of Commissioners of the City of Tallahassee, Fla., as evidence of good faith on the part of the bidder.

Specifications may be obtained after February 25th upon deposit of $20.00 by addressing direct the Engineers at Charlottee, N. C. Such deposit will be refunded upon the return of the specifications in good condition.

All bids must be made on blank forms provided for this purpose.

The Board reserves the right to reject any or all bids.

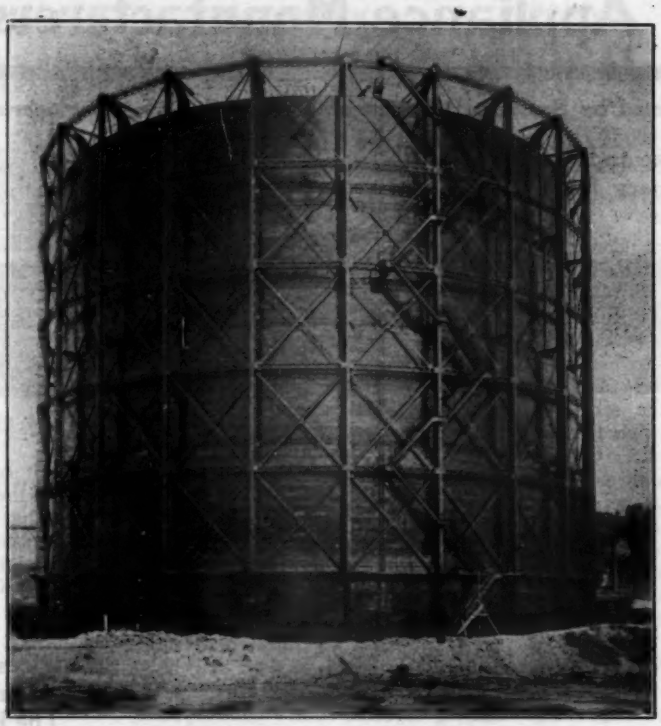
MEES & MEES, Consulting Engineers,
310 Trust Building, Charlotte, N. C.

A. H. WILLIAMS, City Clerk.

RITER-CONLEY CO.

PITTSBURGH, PA.

PURIFYING BOXES



STEEL TANKS

BUILDERS OF

TWENTY YEARS EXPERIENCE **GAS HOLDERS** HAS TAUGHT US HOW

STEEL CONSTRUCTION OF ALL KINDS

Philadelphia Pottstown Detroit Chicago Cincinnati
Washington New York Boston Syracuse San Francisco

You adopt improved machinery and systems. Why not use better meters,

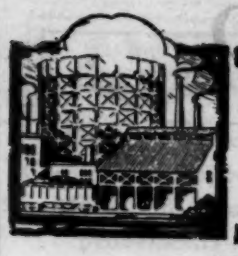
SUPERIOR METERS

Although standard type, are built stronger and embody many improvements that assure Better Service.

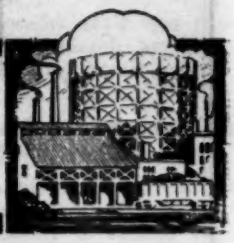
Write for illustrated Booklets and get our quotations. They will interest you.

Superior Meter Co. **Bush Terminal, Brooklyn, N. Y.**

Manufacturers of Provers, Syphon Gauges, Portable Test Meters, Oxygen, Hydrogen and Acetylene Wet Meters, High Pressure Flow Meters, All Kinds of Gas Apparatus and Calorimeters.



With The Equipment & Appliance Manufacturers



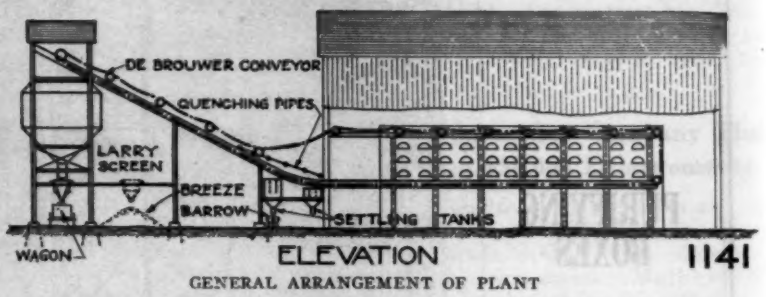
Conducted by Business Department of American Gas Engineering Journal

New Catalog on Coke and Coal Handling Machinery for Gas Plants

The R. H. Beaumont Company, Philadelphia, Pa., has just issued a new catalogue entitled "Coke and Coal Handling Systems for Gas Plants."

They state that "while this catalogue covers both coal and coke handling machinery, greater stress is laid on the machines which handle, crush and screen the coke. Coal is by nature graphitic, and as such causes little wear to the conveying medium, but coke handling presents an entirely different problem. Coke is extremely abrasive, and few machines will handle it successfully owing to the destructive action of the coke in such vital parts as the chain joints, also by the chemical action of red-hot or dripping wet coke."

One illustration shows conveying apparatus in conjunction with horizontal through retorts with 1,000,000 cu. ft. capacity at the Taunton Gas Light Company, Taunton, Mass. The other illustration shows the general arrangement of the plant.



GENERAL ARRANGEMENT OF PLANT

The catalogue contains a number of cuts showing a variety of installations in gas companies, also illustrated descriptions of their skip hoist winding machines, coke crushers, vibrating screens, rotary coke screens, flight conveyors, belt conveyors, and several other appliances for use around the gas company plant. They state that this company specializes only on coal, coke and ash handling installations for boiler and gas houses. Catalogue will be sent on request.

HORIZONTAL THROUGH RETORTS AT TAUNTON GAS LIGHT COMPANY

Matrices for Newspaper Advertisements Furnished by The Kompak Company

The Kompak Company, New Brunswick, N. J., maker of "Kompak" water heaters, has had set up a series of newspaper advertisements of assorted sizes. Matrices have been made of all of them and they offer to send a set of these to any gas company, or any part or size desired. A space has been left to fill in name of gas company, and this copy can be used in the company space in the local newspapers.

New Compound for Cleaning Meters

The Standard Chemical & Supply Company, Cambridge, Mass., calls attention, in a circular recently issued, to the Davis Brown compound which is used to clean and strip gas meters. The circular states that "it saves the hard and tedious work of removing scale with chisel and hammer. It is efficient and safe, because it does not eat away or otherwise injure the delicate working parts of meters. Seven pounds of compound is used to 45 gal. of water." A sample of the compound will be sent on request.